ORDER NO. ARD82060166C2-24

Service Manual

Cassette Deck

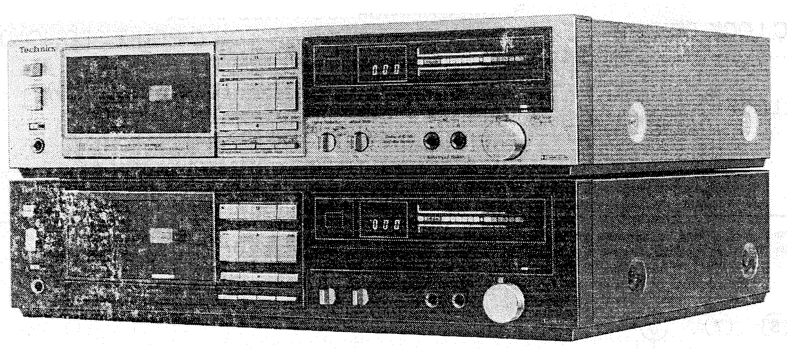
RS-M265X

(Silver Face
Black Face)

dbx -Equipped Microprocessor
Controlled Cassette Deck

DOLBY B·C NR

This is the Service Manual for the following areas.
Ⓓ ········ For all European areas except United Kingdom.
Ⓑ ········ For United Kingdom.



RS-M250 MECHANISM SERIES

Specifications

Track system: 4-track 2-channel stereo recording and playback
Tape speed: 4.8 cm/s
Wow and flutter: 0.045% (WRMS), ±0.14% (DIN)
Frequency response: Metal tape; 20 — 20,000 Hz
25 — 19,000 Hz (DIN)
30 — 18,000 Hz ±3 dB
CrO₂ tape; 20 — 19,000 Hz
25 — 18,000 Hz (DIN)
30 — 17,000 Hz ±3 dB
Normal tape; 20 — 18,000 Hz
25 — 17,000 Hz (DIN)
30 — 16,000 Hz ±3 dB
Dynamic range: 110 dB (at 1 kHz), dbx in
Max. input level improvement: 10 dB or more improved with dbx in (at 1 kHz)
Signal-to-noise ratio: dbx* in; 92 dB
Dolby** C NR in; 76 dB (CCIR)
Dolby B NR in; 68 dB (CCIR)
NR off; 58 dB (signal level = max. input level A weighted, CrO₂ type tape)

Fast forward and rewind time: Approx. 90 seconds with C-60 cassette tape
Inputs: MIC; sensitivity 0.25 mV, applicable microphone impedance 400 Ω — 10 kΩ
LINE; sensitivity 60 mV, input impedance more than 47 kΩ
Outputs: LINE; output level 700 mV, output impedance 1.5 kΩ or less
HEADPHONES; output level 130 mV (8 Ω) applicable headphone impedance 8 Ω — 600 Ω
Bias frequency: 85 kHz
Motor: 2-motor system
Heads: 2-head system
1-AX (AMORPHOUS) head for record/playback
1-double-gap ferrite head for erasure
Power requirement: 110/125/220/240 V, 50-60 Hz
Pre-set power voltage; Ⓓ ··· 220 V, Ⓑ ··· 240 V
Power consumption; 37 W
Dimensions: 43 cm (W) × 9.8 cm (H) × 32.6 cm (D)
Weight: 6.3 kg

Specifications are subject to change without notice.
The term dbx is a registered trademark of dbx Inc.
'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

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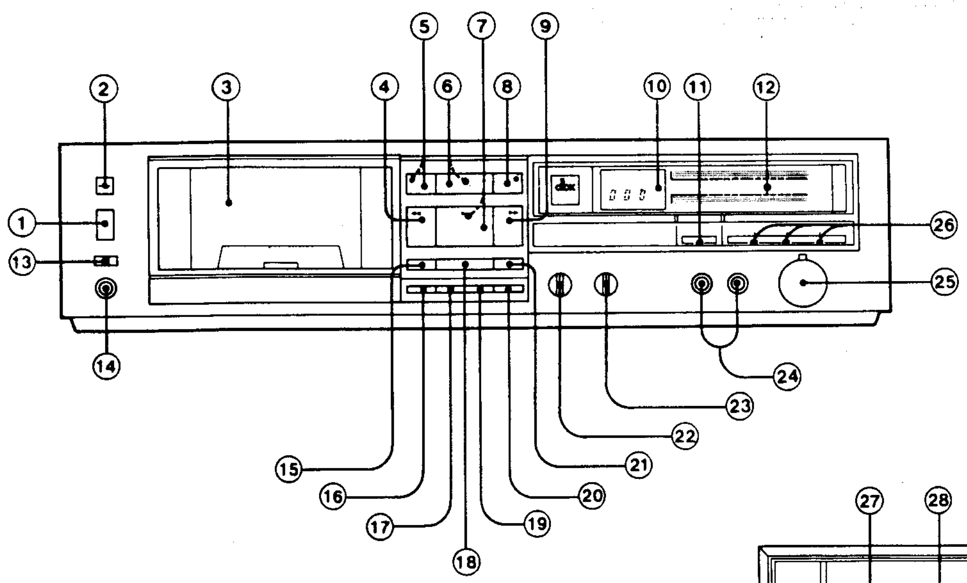
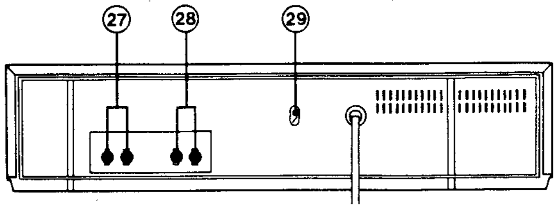
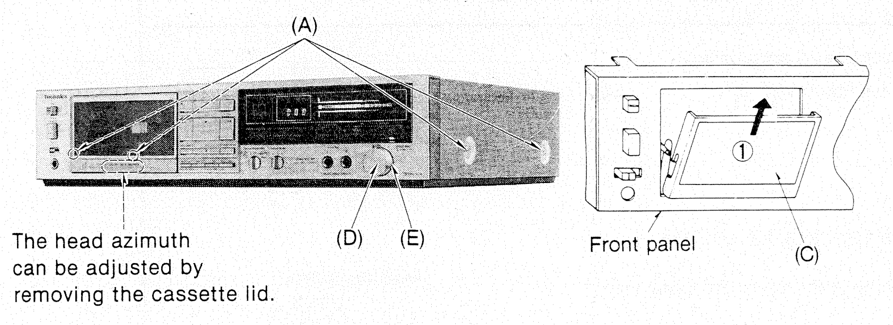
LOCATION OF CONTROLS AND COMPONENTS





① **Power Switch [power (push on)]**
② **Eject Button [eject]**
③ **Cassette Holder**
④ **Rewind Button [rew (M.S) (◀◀)]**
⑤ **Record Button and Indicator [rec (○)]**
⑥ **Pause Button and Indicator [pause (❚❚)]**
⑦ **Play Button and Indicator [play (▶)]**
⑧ **Record Muting Button [rec mute (⭘)]**
⑨ **Fast Forward Button [ff (M.S) (▶▶)]**
⑩ **Digital Multi Counter [multi counter]**
⑪ **Intro Search Indicator [intro search • on]**
⑫ **FL (fluorescent lever) Meters**
⑬ **Timer Start Switch [◷ timer (rec • off • play)]**
⑭ **Headphones Jack [phones]**
⑮ **Intro Search Button [intro search]**
⑯ **Memory Repeat Button [memory repeat (■ off • —on)]**
⑰ **Tape/Time Select Button [tape/ time]**
⑱ **Stop Button [stop (■)]**
⑲ **Set Button [set]**
⑳ **Music Select Button [music select]**
㉑ **Counter Reset Button [counter reset]**
㉒ **Noise Reduction Select Switch [Noise Reduction (Dolby NR C • B • out • dbx tape • disc)]**
㉓ **Output Level Control [output level]**
㉔ **Microphone Jacks [mic (L • R)]**
㉕ **Input Level Controls [input level (L -◉- R)]**
㉖ **Tape Indicator [Auto Tape Select (Normal • CrO$_2$ • Metal)]**
㉗ **Line Output Jacks [LINE OUT (R • L)]**
㉘ **Line Input Jacks [LINE IN (R • L)]**
㉙ **Voltage Selector [VOLTAGE SELECTOR]**

DISASSEMBLY INSTRUCTIONS


(A)
(D)
(E)
①
Front panel
(C)

The head azimuth can be adjusted by removing the cassette lid.

Fig. 1

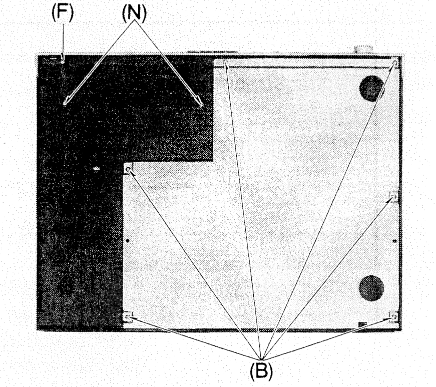


Fig. 2

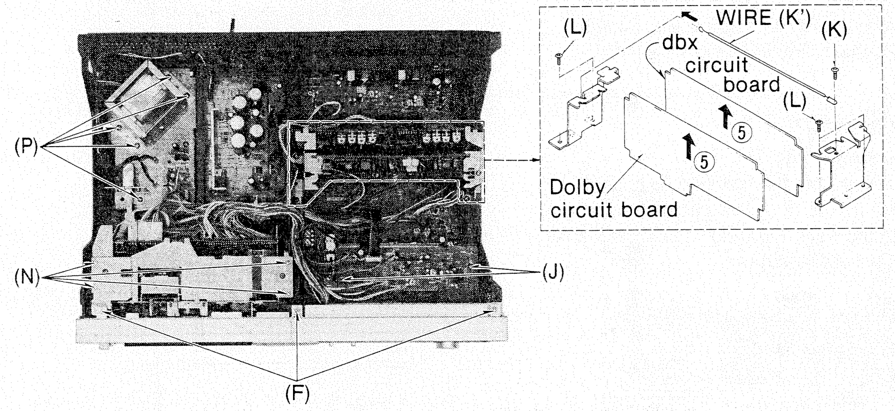

(P)
(N)
(F)
(J)
(L)
WIRE (K')
(K)
dbx circuit board
(L)
⑤
⑤
Dolby circuit board

Fig. 3

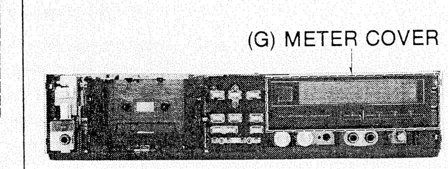

(G) METER COVER

Fig. 4

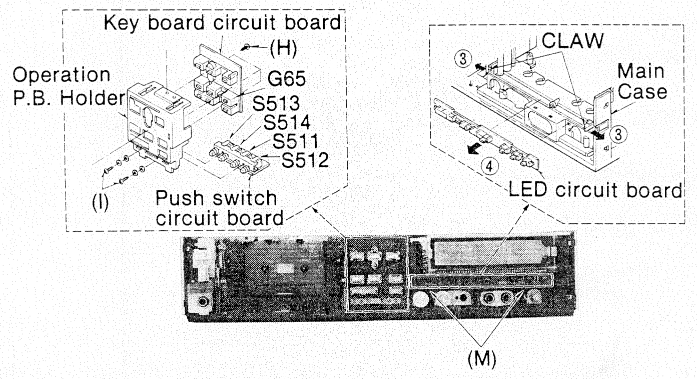

Key board circuit board
(H)
Operation P.B. Holder
G65
S513
S514
S511
S512
(I)
Push switch circuit board
③
CLAW
Main Case
③
④
LED circuit board
(M)

Fig. 5

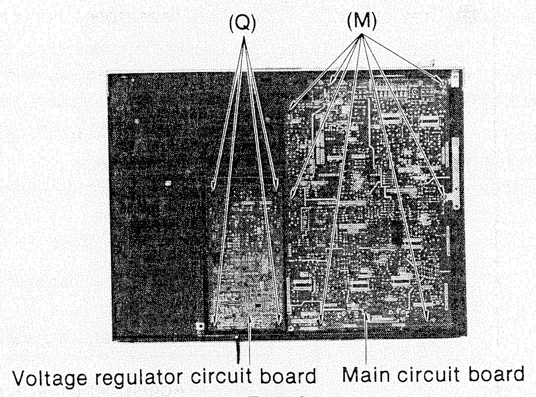

(Q)
(M)
Voltage regulator circuit board
Main circuit board

Fig. 6

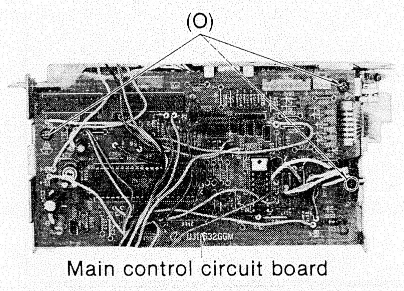

(O)
Main control circuit board

Fig. 7

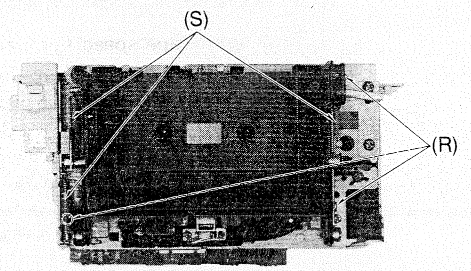
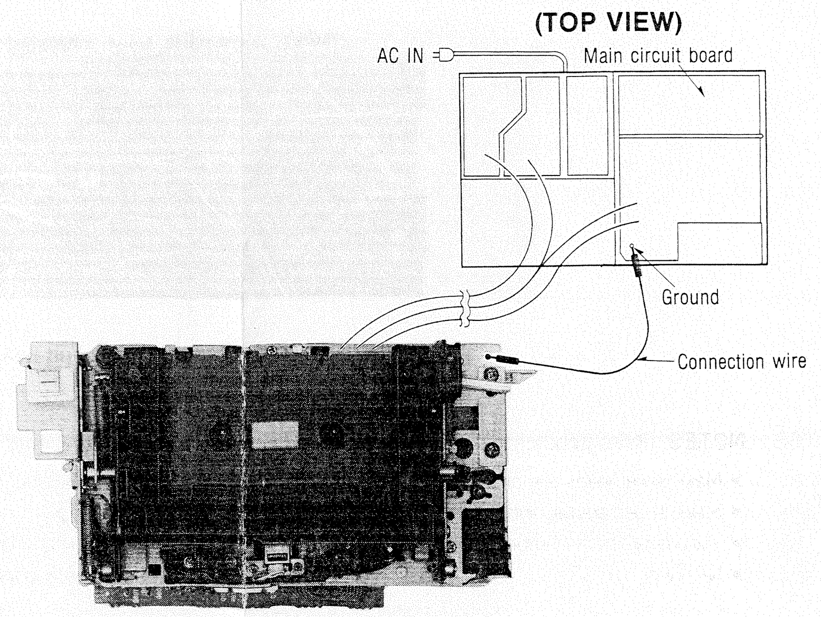


Fig. 8

Ref. No.	Procedure	To remove	Remove	Shown in fig.
1	1	Case cover	• 4 screws ……………… (A)	1
2	2	Bottom cover	• 6 screws ……………… (B)	2
3	1→2→3	Front panel	• Cassette lid ……………… (C) (As shown in fig. 1, pull out in the direction of arrow ①.) • Volume knob-A ……………… (D) • Volume knob-B ……………… (E) • 4 screws ……………… (F)	1 1 1 2, 3
4	1→3→4	Push switch circuit board and key board circuit board	• Meter cover ……………… (G) • 3 screws ……………… (H) • 2 screws ……………… (I)	4 5 5
5	1→3→5	FL meter	• 2 red screws ……………… (J)	3
6	1→3→5→6	LED circuit board	• As shown in fig. 5, pull the claw in the direction of arrow ③, then pull LED circuit board in the direction of arrow ④. Then, it can be removed.	5
7	1→3→7	dbx circuit board and Dolby circuit board	• 1 screw ……………… (K) • Wire ……………… (K)' • 4 screws (As shown in fig. 3, pull Dolby and dbx circuit board in the direction of arrow ⑤.)	3 3 3
8	1→2→3→5→7→8	Main circuit board	• 9 red screws ……………… (M)	5, 6
9	1→3→9	Mechanism unit	• 6 screws ……………… (N) (As shown in fig. 5, pull out operation P.B. holder.)	2, 3
10	1→3→9→10	Main control circuit board	• 3 screws ……………… (O)	7
11	1→11	Power transformer circuit board	• 5 screws ……………… (P)	3
12	1→12	Voltage regulator circuit board	• 4 screws ……………… (Q)	6
13	1→3→9→13	Cassette holder assembly	• 3 screws ……………… (R) • Lock lever spring ……………… (S)	8 8

• DISASSEMBLY NOTES

1. For repair, measurement or adjustment with the front panel and mechanism removed from the unit be sure to ground the lower base plate of the mechanism.
2. For grounding, connect a extension cord to the mechanism's lower base plate and ground for main circuit board.
3. Without grounding, the auto tape selector does not operate properly.

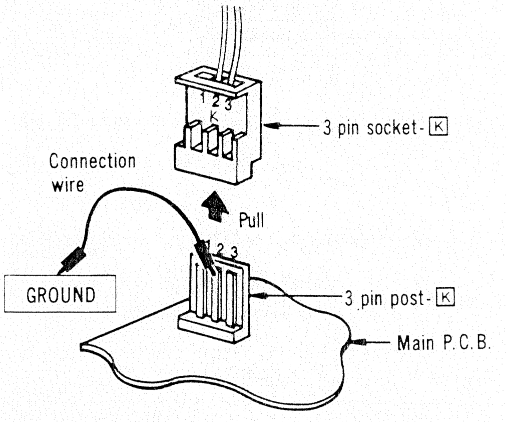

(TOP VIEW)
AC IN
Main circuit board
Ground
Connection wire

MEASUREMENT AND ADJUSTMENT METHODS (WITHOUT dbx SYSTEM)

Tape selector (Tape mode switching)

For measurement adjustment with test tapes without tape detection holes, switch tape modes as follows.
(For normal tape mode, just insert a normal tape into the cassette holder.)

- ∗ **Metal tape mode setting:**
  Metal tape mode is obtained by disconnecting the 3 pin socket $\boxed{K}$ from the 3 pin post $\boxed{K}$ on the P.C.B. (Printed Circuit Board).
- ∗ **CrO₂ tape mode setting:**
  First, disconnect the 3 pin socket $\boxed{K}$ in the same way as above. Then, as illustrated in the figure right, connect the terminal-2 of the 3 pin post to the ground with a connection wire.


1 2 3
K
3 pin socket-K
Connection wire
Pull
1 2 3
GROUND
3 pin post-K
Main P.C.B.

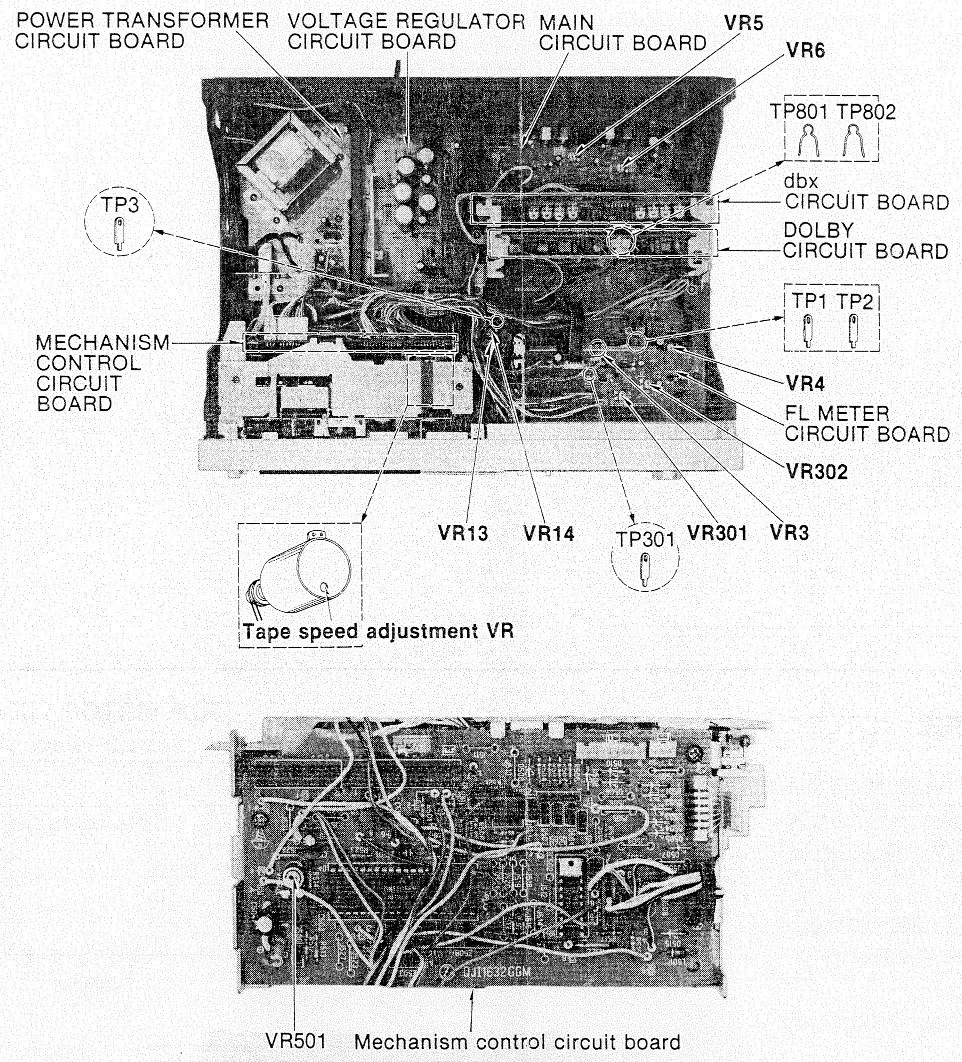
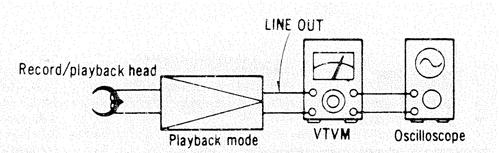
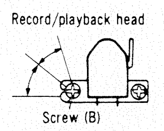
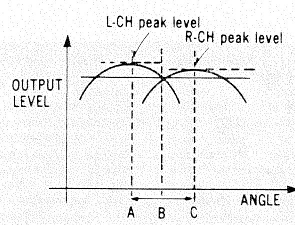
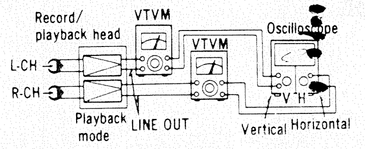
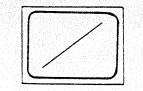
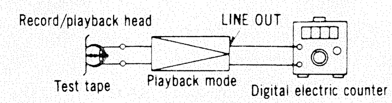

POWER TRANSFORMER CIRCUIT BOARD
VOLTAGE REGULATOR CIRCUIT BOARD
MAIN CIRCUIT BOARD
VR5
VR6
TP801 TP802
dbx CIRCUIT BOARD
DOLBY CIRCUIT BOARD
TP1 TP2
VR4
FL METER CIRCUIT BOARD
VR302
TP3
MECHANISM CONTROL CIRCUIT BOARD
VR13
VR14
TP301
VR301
VR3
Tape speed adjustment VR
VR501
Mechanism control circuit board

Fig. 1

NOTES: Keep good condition, set switches and controls in the following positions, unless otherwise specified.

- Make sure heads are clean.
- Make sure capstan and pressure roller are clean.
- Judgeable room temperature: 20±5°C (68±9°F)
- NR switch: OUT
- Timer start switch: OFF
- Intro search: OFF
- Input level controls: Maximum
- Output level control: Maximum

ITEM	MEASUREMENT & ADJUSTMENT
Ⓐ Head azimuth adjustment Condition: ∗ Playback mode Equipment: ∗ VTVM ∗ Oscilloscope ∗ Test tape (azimuth) ··· QZZCFM	**L-CH/R-CH output balance adjustment** 1. Make connections as shown in fig. 2.  LINE OUT Record/playback head Playback mode VTVM Oscilloscope Fig. 2 2. Playback the 8 kHz signal from the test tape (QZZCFM). Adjust screw (B) in fig. 3 for maximum output L-CH and R-CH levels. When the output levels of L-CH and R-CH are not at maximum at the same time, readjust as follows. 3. Turn the screw shown in fig. 3 to find angles A and C (points where peak output levels for left and right channels are obtained). Then, locate the angle B between angles A and C, i.e., a point where L-CH and R-CH output levels come together at maximum. (Refer to figs. 3 and 4.)  Record/playback head Screw (B) Fig. 3  Fig. 4 **L-CH/R-CH phase adjustment** 4. Make connections as shown in fig. 5. 5. Playback the 8 kHz signal from the test tape (QZZCFM). Adjust screw (B) shown in fig. 3 so that pointers of the two VTVMs swing to maximum and a waveform as illustrated in fig. 6 is obtained on the oscilloscope.  Record/ playback head VTVM VTVM Oscilloscope L-CH R-CH Playback mode LINE OUT V H Vertical Horizontal Fig. 5  Fig. 6
Ⓑ Tape speed Condition: ∗ Playback mode ∗ Normal tape mode Equipment: ∗ Digital electronic counter ∗ Test tape ··· QZZCWAT	**Tape speed accuracy** 1. Test equipment connection is shown in fig. 7. 2. Playback test tape (QZZCWAT 3,000 Hz), and supply playback signal to frequency counter. 3. Take measurement at middle section of tape. 4. Measure this frequency. 5. On the basis of 3,000 Hz, determine value by following formula: $\text{Tape speed accuracy} = \frac{f - 3{,}000}{3{,}000} \times 100\ (\%)$ where, f = measured value Standard value: ±1.5%  Record/playback head LINE OUT Test tape Playback mode Digital electric counter Fig. 7 **Adjustment method** 1. Playback the test tape (middle). 2. Adjust so that frequency becomes 3,000 Hz. 3. Tape speed adjustment VR shown in fig. 1. **Tape speed fluctuation** Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows: $\text{Tape speed fluctuation} = \frac{f_1 - f_2}{3{,}000} \times 100\ (\%)$ f_1 = maximum value, f_2 = minimum value Standard value: Less than 1%

<table>
<tr><th>ITEM</th><th>MEASUREMENT & ADJUSTMENT</th></tr>
<tr><td>

Ⓒ Playback frequency response

Condition:
- Playback mode
- Normal tape mode

Equipment:
- VTVM
- Oscilloscope
- Test tape ··· QZZCFM

</td><td>

1. Test equipment connection is shown in fig. 2.
2. Place UNIT into playback mode.
3. Playback the frequency response test tape (QZZCFM).
4. Measure output level at 12.5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz and 63Hz, and compare each output level with the standard frequency 315Hz, at LINE OUT.
5. Make measurement for both channels.
6. Make sure that the measured value is within the range specified in the frequency response chart. (Shown in fig. 8.)

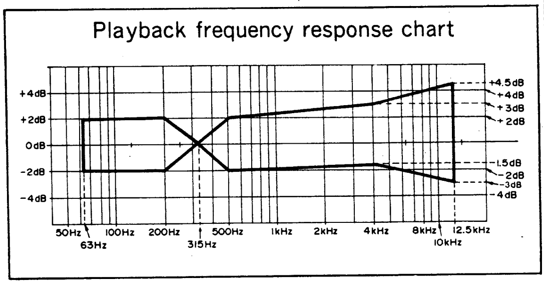


Fig. 8

</td></tr>
<tr><td>

Ⓓ Playback gain

Condition:
- Playback mode
- Normal tape mode

Equipment:
- VTVM
- Oscilloscope
- Test tape ··· QZZCFM

</td><td>

1. Test equipment connection is shown in fig. 2.
2. Playback standard recording level portion on test tape (QZZCFM 315Hz, 0dB), and using VTVM measure the output level at LINE OUT jack.
3. Make measurement for both channels.

Standard value:
0.7 ±0.1dB [0.28V: at test points TP801 (L-CH) and TP802 (R-CH)]

Adjustment

1. If measured value is not within standard, adjust VR3 (L-CH), VR4 (R-CH) (shown in fig. 1).
2. After adjustment, check "Playback frequency response" again.

</td></tr>
<tr><td>

Ⓔ Erase current

Condition:
- Record mode
- Metal tape mode

Equipment:
- VTVM
- Oscilloscope

</td><td>

1. Test equipment connection is shown in fig. 9.
2. Place UNIT into metal tape mode.
3. Press the record and pause buttons.
4. Read voltage on VTVM and calculate erase current by following formula.

$$\text{Erase current (A)} = \frac{\text{Voltage across both ends of R127}}{1\ (\Omega)}$$

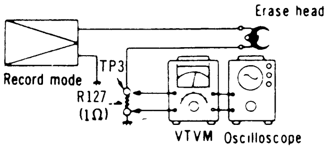


Fig. 9

Standard value: 150^{+15}_{-10}mA (Metal position)

5. If measured value is not within standard, adjust as follows.

Adjustment

1. Open the point (B) and short the point (A) on the main circuit board in the circuit board diagram (See page 27).
2. Make measurement for erase current.
3. Make sure that the measured value is within the erase current of 140mA to 170mA.
4. If it is beyond the value, carry out the following adjustments:
   - If the erase current is less than 140mA, open the point (A) and (B).
   - If the erase current is more than 165mA, short the points (A) and (B).

</td></tr>
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Ⓕ Overall frequency response

Condition:
- Record/playback mode
- Normal tape mode
- CrO2 tape mode
- Metal tape mode
- Input level controls ··· MAX
- Output level control ··· MAX

</td><td>

Note:

Before measuring and adjusting, make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response).

Overall frequency response adjustment by recording bias current

(Recording equalizer is fixed)

1. Make connections as shown in fig. 11.
2. Place UNIT into normal tape mode and load the test tape (QZZCRA).

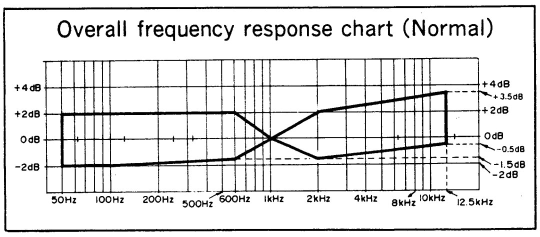


Fig. 10

</td></tr>
</table>

ITEM

Equipment:
- VTVM
- AF oscillator
- ATT
- Oscilloscope
- Resistor (600 Ω)
- Test tape
  (reference blank tape)
  ··· QZZCRA for Normal
  ··· QZZCRX for CrO2
  ··· QZZCRZ for Metal

MEASUREMENT & ADJUSTMENT

3. Input a 1kHz, −24 dB signal through LINE IN.
   Place the set in record mode.
4. Fine adjust the attenuator to obtain 0.7 V LINE OUT output.
   - Make sure that the input signal level is −24 ± 4 dB with 0.7 V output voltage.
5. Adjust the attenuator to reduce the input signal level by 20 dB.
6. Adjust the AF oscillator to generate 50 Hz, 100 Hz, 200 Hz, 500 Hz, 1 kHz, 4 kHz, 8 kHz, 10 kHz and 12.5 kHz signals, and record these signals on the test tape.
7. Playback the signals recorded in step 6, and check if the frequency response curve is within the limits shown in the overall frequency response chart for normal tapes (fig. 10).
   (If the curve is within the charted specifications, proceed to steps 8, 9, 10 and 11.)
   If the curve is not within the charted specifications, adjust as follows;

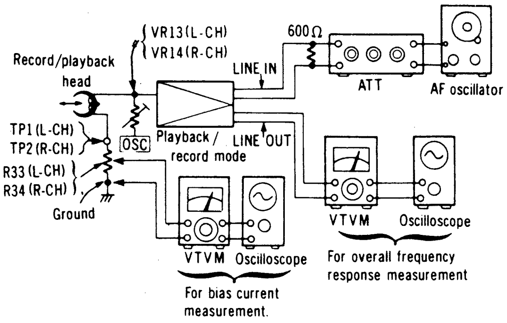

VR13(L-CH)
VR14(R-CH)
600Ω
Record/playback head
LINE IN
ATT
AF oscillator
TP1(L-CH)
TP2(R-CH)
OSC
Playback / record mode
LINE OUT
R33(L-CH)
R34(R-CH)
Ground
VTVM
Oscilloscope
For overall frequency response measurement
VTVM
Oscilloscope
For bias current measurement.

Fig. 11

Adjustment Ⓐ:

When the curve exceeds the overall frequency response chart specifications (fig. 10) as shown in fig. 12.

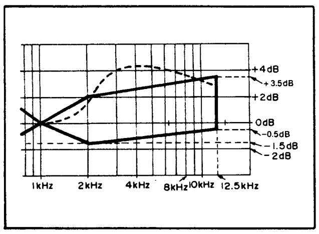


Fig. 12

1) Increase bias current by turning VR13 (L-CH) and VR14 (R-CH).
   (See fig. 1 on page 5).
2) Repeat steps 6 and 7 to confirm.
   (Proceed to steps 8, 9, 10 and 11 if the curve is now within the charted specifications is fig. 10.)
3) If the curve still exceeds the specifications (fig. 10), increase bias current further and repeat steps 6 and 7.

Adjustment Ⓑ:

When the curve falls below the overall frequency response chart specifications (fig. 10) as shown in fig. 13.

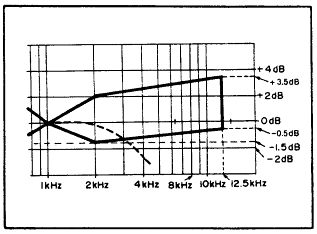


Fig. 13

1) Reduce bias current by turning VR13 (L-CH) and VR14 (R-CH).
2) Repeat steps 6 and 7 to confirm.
   (Proceed to steps 8, 9, 10 and 11 if the curve is now within the charted specifications in fig. 10.)
3) If the curve still falls below the charted specifications (fig. 10), reduce bias current further and repeat steps 6 and 7.

8. Place UNIT into CrO2 tape mode.
9. Change test tape to QZZCRX, and record 50 Hz, 100 Hz, 200 Hz, 500 Hz, 1 kHz, 4 kHz, 8 kHz, 10 kHz and 12.5 kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for CrO2 tapes (fig. 14).

Overall frequency response chart (CrO2, Metal)

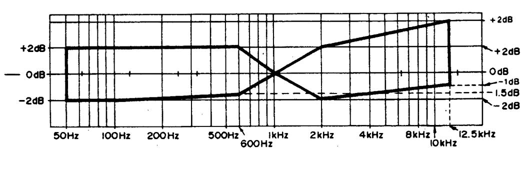
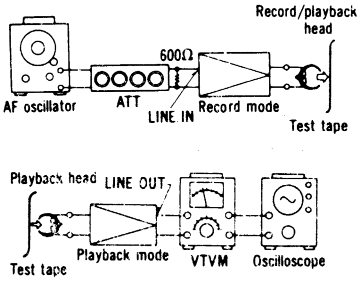
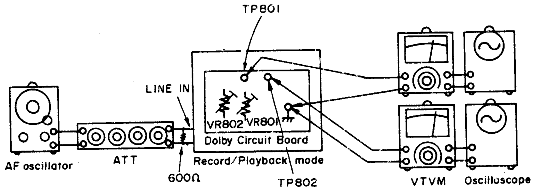
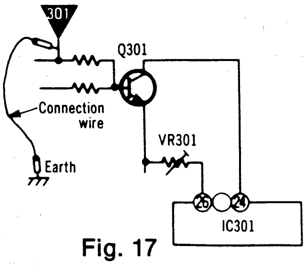
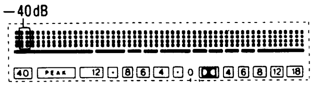
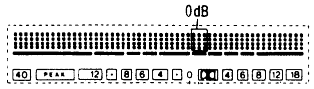
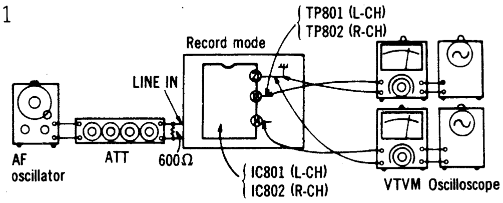
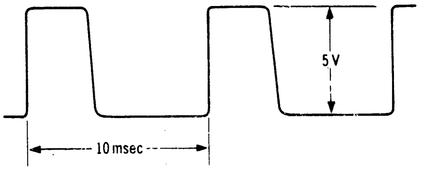
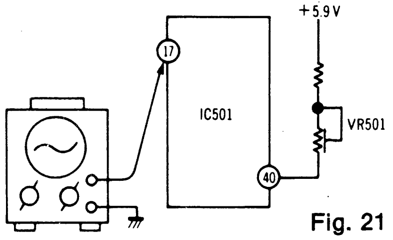


Fig. 14

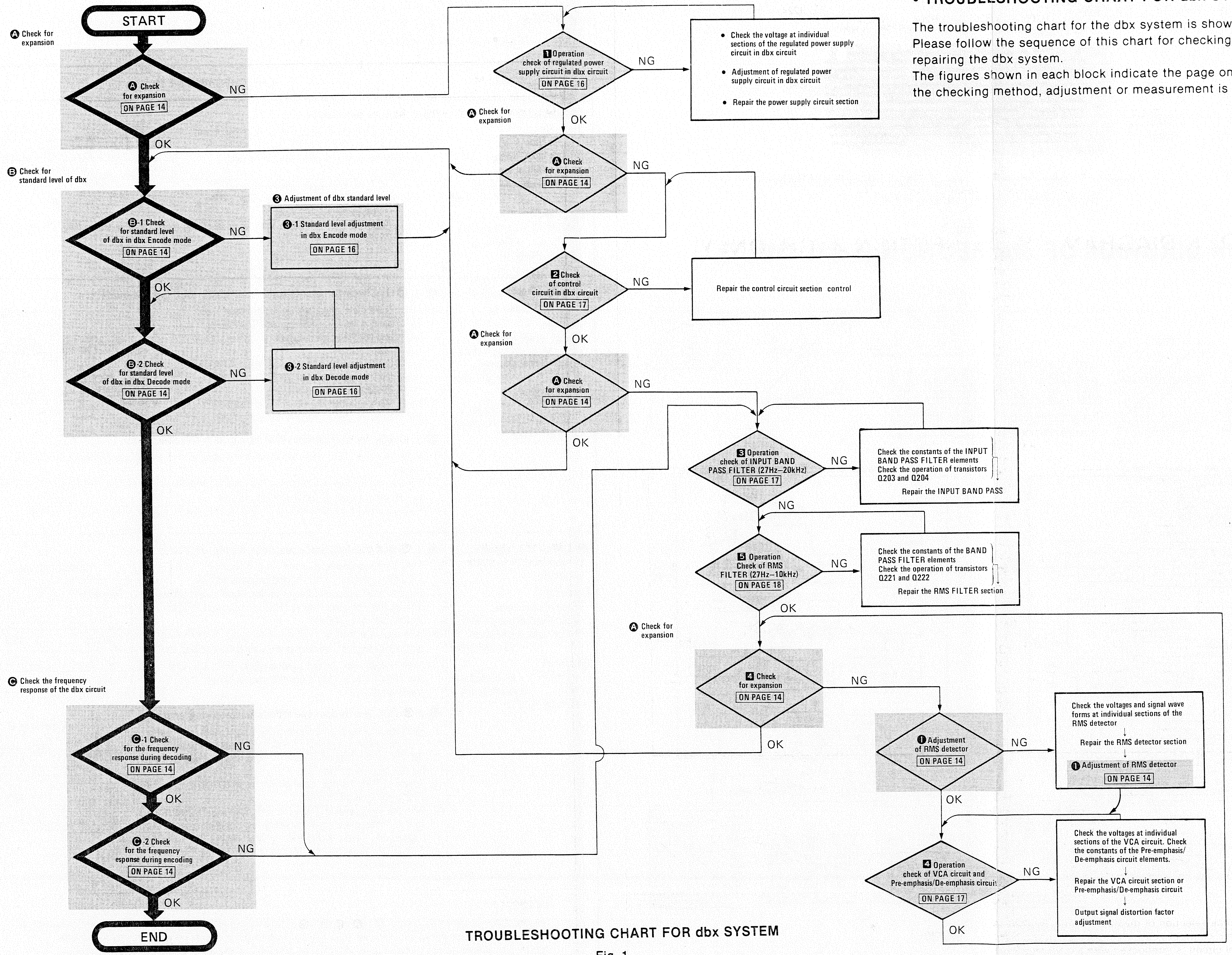
ITEM	MEASUREMENT & ADJUSTMENT
	10. Place UNIT into metal tape mode change test tape to QZZCRZ, and record 50 Hz, 100 Hz, 200 Hz, 500 Hz, 1 kHz, 4 kHz, 8 kHz, 10 kHz and 12.5 kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for metal tapes (fig. 14). 11. Confirm that bias currents are approximately as follows when the UNIT is set at different tape mode. • Read voltage on VTVM and calculate bias current by following formula: $\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10\ (\Omega)}$ **Standard value:** **around 180μA (Normal position)** **around 250μA (CrO$_2$ position)** **around 380μA (Metal position)** **}: measured at TP1 (L-CH) and TP2 (R-CH)**
Ⓖ Overall gain Condition: • Record/playback mode • Normal tape mode • Input level controls ··· MAX • Output level control ··· MAX • Standard input level; MIC ········ −72±3 dB LINE IN ··· −24±3 dB Equipment: • VTVM • AF oscillator • ATT • Oscilloscope • Resistor (600 Ω) • Test tape (reference blank tape) ··· QZZCRA for Normal	1. Test equipment connection is shown in fig. 15. 2. Place UNIT into normal tape mode, and load the test tape (QZZCRA). 3. Place UNIT into record mode. 4. Supply 1 kHz signal (−24 dB) from AF oscillaror, through ATT to LINE IN. 5. Adjust ATT until monitor level at LINE OUT becomes 0.7 V. 6. Playback recorded tape, and make sure the value at LINE OUT on VTVM becomes 0.7 V. 7. If measured value is not 0.7 V, adjust VR5 (L-CH), VR6 (R-CH). 8. Repeat from step (2).  Record/playback head 600Ω AF oscillator ATT LINE IN Record mode Test tape Playback head LINE OUT Playback mode VTVM Oscilloscope Test tape Fig. 15
Ⓗ Fluorescent meter Condition: • Record mode • Input level controls ···· MAX • Output level control ··· MAX Equipment: • VTVM • AF oscillator • ATT	**• Check for FL meter** To check the accuracy of the FL meter, measure the output level at test point [TP801 (L-CH), TP802 (R-CH)]. 1. Make connections as shown (See fig. 16). 2. Connect a wire between TP301 and ground terminal (See fig. 17). 3. In the recording pause mode, apply 1 kHz (−24 dB) to LINE IN. 4. Adjust ATT so that output level at test point [TP801 (L-CH), TP802 (R-CH)] is 0.28 V.  TP801 LINE IN VR802 VR801 Dolby Circuit Board AF oscillator ATT 600Ω Record/Playback mode TP802 VTVM Oscilloscope Fig. 16 **Cheking FL meter 0 dB segment display ON/OFF** Change the output level at test point [TP801 (L-CH), TP802 (R-CH)] from 0.28 V −1 dB (around 250 mV) to 0.28 V +1 dB (around 310 mV) by adjusting the attenuator, and check that the FL meter 0 dB seqment display OFF state changes to the ON state. **Checking FL meter −40 dB segment display ON/OFF** Lower the signal level 28 dB below the standard input level [−24 dB −28 dB = −52 dB (around 2.5 mV)] and then further lower the level 12 dB [−52 dB −12 dB = −64 dB (around 0.63 mV)] by adjusting the attenuator. While lowering the level as described above, make sure that only the −40 dB display remains lit, then dims or goes off at the lowest level.

ITEM	MEASUREMENT & ADJUSTMENT
	• Adjustment for FL meter 1. Make connections as shown (See fig. 16). 2. Connect a wire between TP301 and ground terminal (See fig. 17). 3. In the recording pause mode, apply 1 kHz (−24 dB) to LINE IN. 4. Adjust ATT so that output level at test point [TP801 (L-CH), TP802 (R-CH)] is 0.28 V.  301 Q301 Connection wire Earth VR301 26 24 IC301 Fig. 17 **−40 dB adjustment** 5. Adjust ATT so that the level adjusted at step 4 is reuced by 40 dB. 6. At this time, check that −40 dB indicator is dimmed (intermediate brightness between full brightness and light-out: See fig. 18). 7. If the indicator is not lighted halfway as described in step 6, adjust VR302.  −40dB 40 PEAK 12 8 6 4 0 4 6 8 12 18 Fig. 18 **0 dB adjustment** 8. Restore the condition of step 4 (set output level to 0.28 V at test point [TP801 (L-CH), TP802 (R-CH)]).  0dB 40 PEAK 12 8 6 4 0 4 6 8 12 18 Fig. 19 9. At this time, check that 0 dB indicator is dimmed (intermediate brightness between full brightness and light-out: See fig. 19). 10. If improper, adjust VR301. 11. Repeat adjustments and checks at steps 4, 5, 6, 7, 8, 9 and 10 two or three times. 12. Disconnect the wire between TP301 and ground terminal, which had been connected at step 2.
Ⓘ Dolby NR circuit Condition: * Record mode * Dolby NR select switch ··· OUT/B/C * Input level controls ····· MAX Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600 Ω)	**Dolby circuit frequency response check** • Check of the Dolby-B type encoder characteristics 1. Make connections as shown in fig. 20. 2. Set the unit to the record mode. (NR select switch is OUT.) 3. Apply a 1 kHz signal to LINE IN. 4. Adjust the ATT so that the output level at TP801 (L-CH) and TP802 (R-CH) is 12 mV. 5. The output level at pin 14 should be 0 dB. 6. Set the NR select switch to B, and make sure that the output signal level at pin 14 of IC801 (L-CH) and IC802 (R-CH) is +6 dB±2.5 dB. 7. Set the NR select switch to OUT, and adjust the frequency to 5 kHz. The output signal level at pin 14 should be 0 dB. 8. Set the NR select switch to B and make sure that the output signal level at pin 14 of IC801 (L-CH) and IC802 (R-CH)is 8 dB±2.5 dB. • Check of Dolby-C type encoder characteristics 9. Repeat steps 1-5 above. 10. Set the NR select switch to C and make sure that the output signal level at pin 14 of IC801 (L-CH) and IC802 (R-CH) is 11.5 dB±2.5 dB. 11. Set the NR select switch to OUT and adjust the frequency to 5 kHz. The output signal at pin 14 should be 0 dB. 12. Set the NR select switch to C and make sure that the output signal level at pin 14 of IC801 (L-CH) and IC802 (R-CH) is 8.5 dB±2.5 dB.  TP801 (L-CH) TP802 (R-CH) Record mode LINE IN AF oscillator ATT 600Ω IC801 (L-CH) IC802 (R-CH) VTVM Oscilloscope Fig. 20
Ⓙ Input scanning time adjustment Condition: * Stop mode Equipment: * Oscilloscope	1. Connect oscilloscope to ⑰ terminal of IC501. 2. Measure the time of input scanning signal with oscilloscope as shown in fig. 21. **Standard value: About 10 msec** 3. If the measured value is markedly different from the signal shown below, make the necessary adjustment with VR501.   Fig. 21

MEASUREMENT AND ADJUSTMENT METHODS (FOR dbx SYSTEM)

• TROUBLESHOOTING CHART FOR dbx SYSTEM

The troubleshooting chart for the dbx system is shown in Fig. 1. Please follow the sequence of this chart for checking and repairing the dbx system.
The figures shown in each block indicate the page on which the checking method, adjustment or measurement is explamed.


START
Ⓐ Check for expansion
Ⓐ Check for expansion ON PAGE 14
NG
OK
Ⓑ Check for standard level of dbx
Ⓑ-1 Check for standard level of dbx in dbx Encode mode ON PAGE 14
NG
OK
Ⓑ-2 Check for standard level of dbx in dbx Decode mode ON PAGE 14
NG
OK
❸ Adjustment of dbx standard level
❸-1 Standard level adjustment in dbx Encode mode ON PAGE 16
❸-2 Standard level adjustment in dbx Decode mode ON PAGE 16
Ⓒ Check the frequency response of the dbx circuit
Ⓒ-1 Check for the frequency response during decoding ON PAGE 14
NG
OK
Ⓒ-2 Check for the frequency esponse during encoding ON PAGE 14
NG
OK
END
1 Operation check of regulated power supply circuit in dbx circuit ON PAGE 16
NG
OK
• Check the voltage at individual sections of the regulated power supply circuit in dbx circuit
• Adjustment of regulated power supply circuit in dbx circuit
• Repair the power supply circuit section
Ⓐ Check for expansion
Ⓐ Check for expansion ON PAGE 14
NG
2 Check of control circuit in dbx circuit ON PAGE 17
NG
OK
Repair the control circuit section control
Ⓐ Check for expansion
Ⓐ Check for expansion ON PAGE 14
NG
OK
3 Operation check of INPUT BAND PASS FILTER (27Hz–20kHz) ON PAGE 17
NG
NG
Check the constants of the INPUT BAND PASS FILTER elements
Check the operation of transistors Q203 and Q204
Repair the INPUT BAND PASS
5 Operation Check of RMS FILTER (27Hz–10kHz) ON PAGE 18
NG
OK
Check the constants of the BAND PASS FILTER elements
Check the operation of transistors Q221 and Q222
Repair the RMS FILTER section
Ⓐ Check for expansion
4 Check for expansion ON PAGE 14
NG
OK
❶ Adjustment of RMS detector ON PAGE 14
NG
OK
Check the voltages and signal wave forms at individual sections of the RMS detector
Repair the RMS detector section
❶ Adjustment of RMS detector ON PAGE 14
4 Operation check of VCA circuit and Pre-emphasis/De-emphasis circuit ON PAGE 17
NG
OK
Check the voltages at individual sections of the VCA circuit. Check the constants of the Pre-emphasis/De-emphasis circuit elements.
Repair the VCA circuit section or Pre-emphasis/De-emphasis circuit
Output signal distortion factor adjustment

TROUBLESHOOTING CHART FOR dbx SYSTEM

Fig. 1

• ADJUSTMENT PARTS LOCATION OF dbx SYSTEM

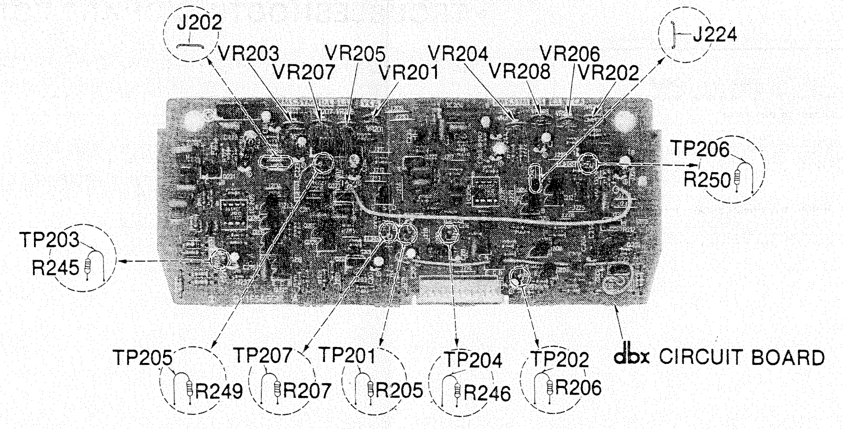

J202
VR203
VR205
VR204
VR206
VR207
VR201
VR208
VR202
J224
TP206
R250
TP203
R245
TP205
R249
TP207
R207
TP201
R205
TP204
R246
TP202
R206
dbx CIRCUIT BOARD

Fig. 2

BLOCK DIAGRAM OF dbx SECTION (L-CH ONLY)

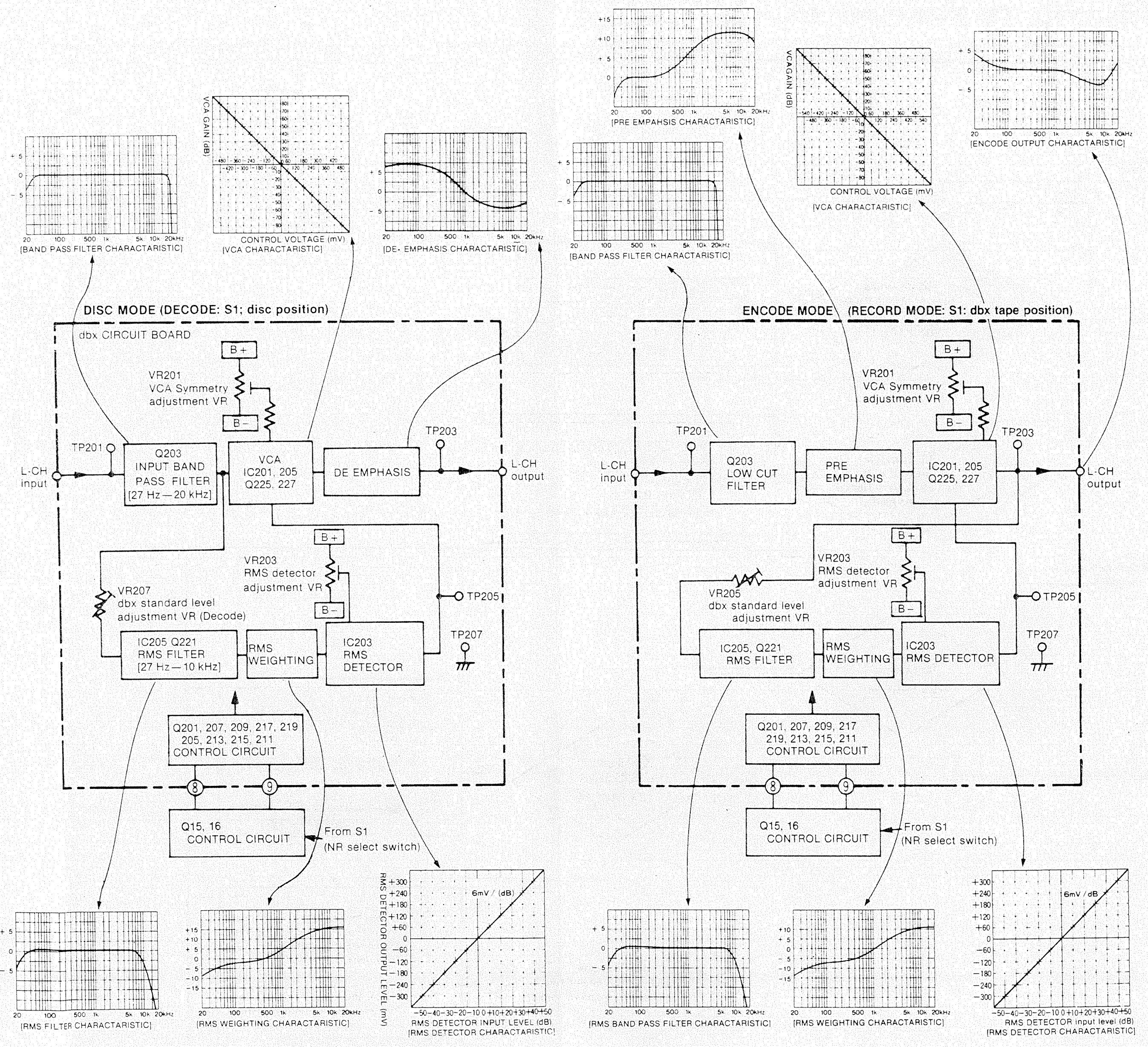

[BAND PASS FILTER CHARACTARISTIC]
VCA GAIN (dB)
CONTROL VOLTAGE (mV)
[VCA CHARACTARISTIC]
[DE- EMPHASIS CHARACTARISTIC]
[BAND PASS FILTER CHARACTARISTIC]
[PRE EMPHASIS CHARACTARISTIC]
[ENCODE OUTPUT CHARACTARISTIC]
DISC MODE (DECODE: S1; disc position)
dbx CIRCUIT BOARD
B+
B−
VR201
VCA Symmetry
adjustment VR
TP201
L-CH
input
Q203
INPUT BAND
PASS FILTER
[27 Hz — 20 kHz]
VCA
IC201, 205
Q225, 227
DE EMPHASIS
TP203
L-CH
output
VR203
RMS detector
adjustment VR
VR207
dbx standard level
adjustment VR (Decode)
TP205
TP207
IC205 Q221
RMS FILTER
[27 Hz — 10 kHz]
RMS
WEIGHTING
IC203
RMS
DETECTOR
Q201, 207, 209, 217, 219
205, 213, 215, 211
CONTROL CIRCUIT
8
9
Q15, 16
CONTROL CIRCUIT
From S1
(NR select switch)
ENCODE MODE (RECORD MODE: S1: dbx tape position)
Q203
LOW CUT
FILTER
PRE
EMPHASIS
IC201, 205
Q225, 227
VR205
dbx standard level
adjustment VR
IC205, Q221
RMS FILTER
RMS
WEIGHTING
IC203
RMS DETECTOR
Q201, 207, 209, 217
219, 213, 215, 211
CONTROL CIRCUIT
[RMS FILTER CHARACTARISTIC]
[RMS WEIGHTING CHARACTARISTIC]
RMS DETECTOR OUTPUT LEVEL (mV)
6mV / (dB)
RMS DETECTOR INPUT LEVEL (dB)
[RMS DETECTOR CHARACTARISTIC]
[RMS BAND PASS FILTER CHARACTARISTIC]
[RMS WEIGHTING CHARACTARISTIC]
6mV / dB
RMS DETECTOR input level (dB)
[RMS DETECTOR CHARACTARISTIC]

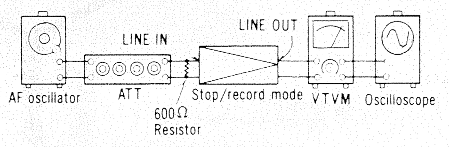
Fig. 3

Note: Encode/decode selection of the dbx circuit in RS-M265X is done with a control circuit, composed of transistors. (This control circuit is interlocked with S1 (NR selection switch).)

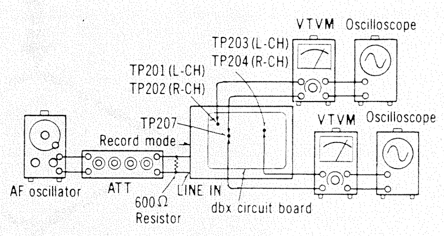
dbx SYSTEM CHECKING METHOD

NOTES: Keep good condition, set switches and controls in the following positions, unless otherwise specified.

- Input level controls: Maximum
- Output level control: Maximum

<table>
<tr><th>ITEM</th><th>CHECKING METHOD</th></tr>
<tr><td>Ⓐ Check for expansion
Condition:
* Stop mode
* Input level controls ··· MAX
* Output level control ··· MAX
* Noise reduction selector ··· disc dbx tape
Equipment:
* VTVM * AF oscillator
* ATT * Oscilloscope
* Resistor (600Ω)</td><td>Ⓐ Check for expansion


LINE IN
LINE OUT
AF oscillator
ATT
600Ω
Resistor
Stop/record mode
VTVM
Oscilloscope

Fig. 4
1. Make the connections as shown in fig. 4 and apply 1 kHz −27 dB signal from LINE IN, and set the noise reduction selector to disc position.
2. Adjust ATT, increase input signal level by 10 dB, and make sure that the reading for VTVM increases by 20 dB ± 1 dB.
3. Adjust ATT, decrease the input signal level, and make sure that the reading for VTVM decreases by 20 dB ± 1 dB.</td></tr>
<tr><td>Ⓑ Check for standard level of dbx
Condition:
* Stop record mode
* Input level controls ··· MAX
* Noise reduction selector ··· disc dbx tape
Equipment:
* VTVM * AF oscillator
* ATT * Oscilloscope
* Resistor (600Ω)</td><td>Ⓑ-1 Check for standard level of dbx in dbx Encode mode


VTVM
Oscilloscope
TP203 (L-CH)
TP204 (R-CH)
TP201 (L-CH)
TP202 (R-CH)
TP207
Record mode
VTVM
Oscilloscope
AF oscillator
ATT
600Ω
Resistor
LINE IN
dbx circuit board

Fig. 5
1. Make the connections as shown in fig. 5 and apply 1 kHz −27 dB signal from LINE IN, and set the noise reduction selector to dbx tape position.
2. Set the unit to record mode, adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300 mV.
3. Make sure that the signal level at TP203 (L-CH) and TP204 (R-CH) is 300 mV ± 0.5 dB.
Ⓑ-2 Check for standard level of dbx in dbx Decode mode
1. Make the connections as shown in fig. 5 and apply 1 kHz −27 dB signal from LINE IN, and check as follows:
2. Set the noise reduction selector to disc position and adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) becomes 300 mV.
3. Make sure that the signal level at TP203 (L-CH) and TP204 (R-CH) is 300 mV ± 0.5 dB.</td></tr>
<tr><td>Ⓒ Check the frequency response of the dbx circuit
Condition:
* Stop record mode
* Input level controls ··· MAX
* Noise reduction selector ··· disc dbx tape
Equipment:
* VTVM * AF oscillator
* ATT * Oscilloscope
* Resistor (600Ω)</td><td>Ⓒ-1 Check the frequency response during decoding
1. Make the connections as shown in fig. 5 and apply 1 kHz −27 dB signal from LINE IN, and check as follows:
2. Set the noise reduction selector to disc position, and adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) becomes 300 mV.
3. With the signal level at TP203 (L-CH) and TP204 (R-CH) as 0 dB, change the signal frequency to 100 Hz, 20 Hz and 7 kHz respectively. Read signal levels at TP203 (L-CH) and TP204 (R-CH) and check that they are within the specifications-1.
Specifications-1<table><tr><th>Frequency</th><th>Signal levels at TP203 and TP204</th></tr><tr><td>1 kHz</td><td>0 dB (300 mV)</td></tr><tr><td>100 Hz</td><td>−0.5 dB ± 1 dB</td></tr><tr><td>20 Hz</td><td>−30 dB ± 5 dB</td></tr><tr><td>7 kHz</td><td>+7 dB ± 1 dB</td></tr></table>Ⓒ-2 Check the frequency response during encoding
1. Make the connections as shown in fig. 5 and apply 1 kHz −27 dB signal from LINE IN, and check as follows:
2. Set the noise reduction selector to dbx tape position, and the unit to record mode.
3. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300 mV.
4. With the signal level at TP203 (L-CH) and TP204 (R-CH) as 0 dB, change the signal frequency to 100 Hz and 7 kHz respectively. Read signal levels at TP203 (L-CH) and TP204 (R-CH) and check that they are within the specifications-2.
Specifications-2<table><tr><th>Frequency</th><th>Signal levels at TP203 and TP204</th></tr><tr><td>1 kHz</td><td>0 dB (300 mV)</td></tr><tr><td>100 Hz</td><td>+0.5 dB ± 1 dB</td></tr><tr><td>7 kHz</td><td>−3.5 dB ± 1 dB</td></tr></table></td></tr>
</table>

NOTES:

- If the results of the above checks Ⓐ, Ⓑ and Ⓒ do not satisfy the specifications, perform the following adjustments.
- If the specifications are not satisfied even after the adjustments, follow the checking procedure for problems.
- If the output signal is not produced or is extremely distorted, follow the checking procedure for problems.

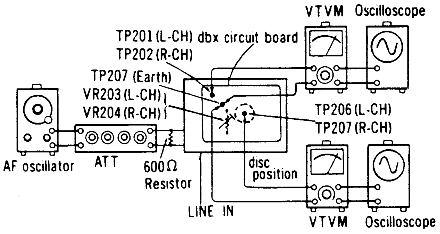
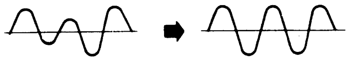
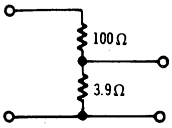
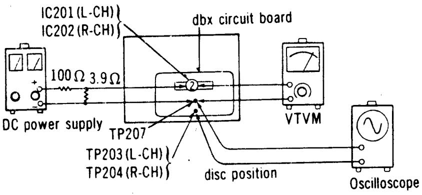
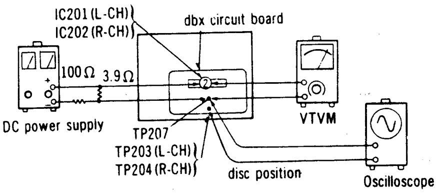
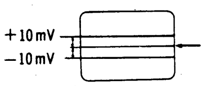
ADJUSTMENT OF dbx SYSTEM

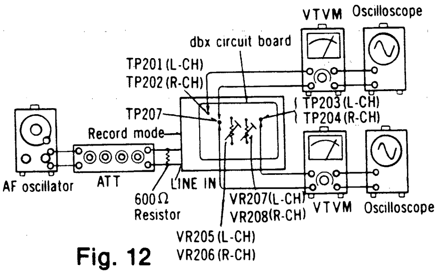
NOTES: When adjusting the circuit of the dbx system, be sure to perform the adjustments in the following order:

❶ Adjustment of RMS detector, ❷ Adjustment of VCA, ❸ Adjustment of dbx standard level.

Keep good condition, set switches and controls in the following positions, unless otherwise specified.

- Input level controls: Maximum

ITEM	ADJUSTMENT
❶ Adjustment of RMS detector Condition: * Stop mode * Input level controls ··· MAX * Noise reduction selector ··· disc Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600Ω)	1. Make the connections as shown in fig. 6, and set the noise reduction selector to disc position. 2. Apply 100Hz −27dB signal from LINE IN. 3. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) becomes 300mV. 4. Make sure that the output signal at TP205 (L-CH) and TP206 (R-CH) is at 200Hz sine wave. If the output signal is not sinusoidal as shown in fig. 7, adjust VR203 (L-CH) and VR204 (R-CH) to make it sinusoidal. NOTE: The voltage of the output signal after adjustment is about 0.5mV rms.  VTVM Oscilloscope TP201 (L-CH) TP202 (R-CH) dbx circuit board TP207 (Earth) VR203 (L-CH) VR204 (R-CH) TP206 (L-CH) TP207 (R-CH) AF oscillator ATT 600Ω Resistor disc position LINE IN VTVM Oscilloscope **Fig. 6**  Wave form before adjustment Wave form after adjustment (sine wave) **Fig. 7**
❷ Adjustment of VCA Condition: * Record/stop mode * Input level controls ··· MAX * Noise reduction selector ··· disc/dbx tape Equipment: * VTVM * Oscilloscope * Resistor (100Ω, 3.9Ω)	**Preparation before adjustment** 1. Before adjusting VCA, from the device shown below using resistors of 100Ω and 3.9Ω (See fig. 8). 2. Set NR switch to dbx disc. Remove jumpers [J202 (L-CH) and J224 (R-CH)]. 3. Arrange connections referring to wire connection diagram (fig. 9 and 10). since 0V, +180mV and −180mV (DC) are applied in this order to pin 2 of IC201 (L-CH) and pin 2 of IC202 (R-CH).  **Fig. 8**  IC201 (L-CH) IC202 (R-CH) dbx circuit board 100Ω 3.9Ω DC power supply TP207 TP203 (L-CH) TP204 (R-CH) disc position VTVM Oscilloscope **Connections when applying +180mV and 0V** Adjust DC power supply and arrange connections so that +180mV or 0V can be applied to TP203 (L-CH) and TP204 (R-CH). **Fig. 9**  IC201 (L-CH) IC202 (R-CH) dbx circuit board 100Ω 3.9Ω DC power supply TP207 TP203 (L-CH) TP204 (R-CH) disc position VTVM Oscilloscope **Connections when applying −180mV** Adjust DC power supply and arrange connections so that −180mV can be applied to TP203 (L-CH) and TP204 (R-CH). **Fig. 10** **Adjustment procedure** 1. Apply 0V to pin ② of IC201 (L-CH) and pin ② of IC202 (R-CH), and a horizontal line will appear on the screen of the oscilloscope. Use this line as the reference line. 2. Apply +180mV to pin ② of IC201 (L-CH) and pin ② of IC202 (R-CH) (See fig. 9), and check that the level is not more than 10mV from the reference line. If improper, adjust VR201 (L-CH) and VR202 (R-CH). 3. In the same way, apply −180mV to pin ② of IC201 (L-CH) and pin ② of IC203 (R-CH) (See fig. 10), and check that the level is not more than 10mV from the reference line. If improper, adjust VR201 (L-CH) and VR202 (R-CH). 4. Repeat steps 2 and 3, and adjust VRs so that the levels are within ±10mV when +180mV and −180mV are applied (fig. 11). 5. After adjustment, connect jumpers J202 (L-CH) and J224 (R-CH) (See fig. 2).  +10mV −10mV Oscilloscope screen When 0V is applied to pin ② of IC201 (L-CH) and pin ② of IC202 (R-CH), this horizontal line appears. **Fig. 11**
❸ Adjustment of dbx standard level Condition: * Record/stop mode * Input level controls ··· MAX	NOTE: Be sure to perform the standard level adjustment in dbx Encode, followed by the standard level adjustment in dbx Decode.

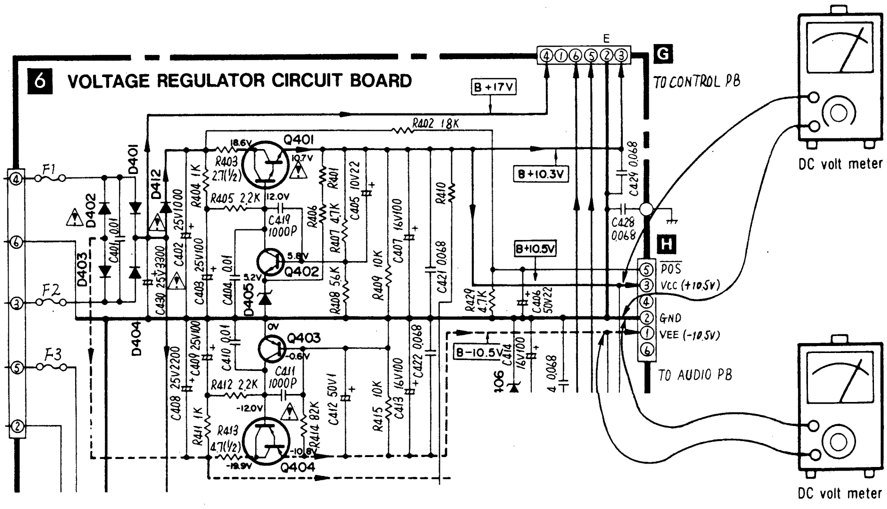
ITEM	ADJUSTMENT
* Noise reduction selector ··· disc/dbx tape Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600Ω)	**❸-1 Standard level adjustment in dbx Encode mode** 1. Make the connection as shown in fig. 12 and apply 1kHz −27dB signal from LINE IN, and set the noise reduction selector to dbx tape position. 2. Set unit to record mode, adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300mV. 3. Adjust VR205 (L-CH) and VR206 (R-CH) so that the output signal level at TP203 (L-CH) and TP204 (R-CH) becomes 300mV±0.5dB.  VTVM Oscilloscope dbx circuit board TP201 (L-CH) TP202 (R-CH) TP207 Record mode TP203 (L-CH) TP204 (R-CH) AF oscillator ATT LINE IN 600Ω Resistor VR207 (L-CH) VR208 (R-CH) VTVM Oscilloscope VR205 (L-CH) VR206 (R-CH) Fig. 12 **❸-2 Standard level adjustment in dbx Decode mode** 1. Make the connection as shown in fig. 12 and apply 1kHz −27dB signal from LINE IN, and perform the following adjustments. 2. Set the noise reduction selector to disc position, and adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) becomes 300mV. 3. Adjust VR207 (L-CH) and VR208 (R-CH) so that the output signal level at TP203 (L-CH) and TP204 (R-CH) becomes 300mV±0.5dB.
NOTES: • After adjustments ❶, ❷ and ❸, re-check according to "dbx SYSTEM CHECKING METHOD". • If the specifications are not satisfied, perform the adjustments again.	

CHECKING PROCEDURE FOR PROBLEMS

NOTES: Find defective parts according to the circuit operation checking method given below, and use the results for your reference during repair. Remember to adjust after repair.

Keep good condition, set switches and controls in the following positions, unless otherwise specified.

- Input level controls: Maximum

ITEM	CHECKING METHOD
1 Operation check of regulated power supply circuit in dbx circuit Equipment: * DC volt meter * Oscilloscope	**1-1 Check of +10.5V voltage** Make the connection as shown in fig. 13 and make sure that the emitter voltage of Q401 is around +10.5V. **1-2 Check of −10.5V voltage** Make the connection as shown in fig. 13 and make sure that the emitter voltage of Q404 is around −10.5V.  6 VOLTAGE REGULATOR CIRCUIT BOARD B+17V R402 18K Q401 Q402 Q403 Q404 D401 D402 D403 D404 D405 D412 F1 F2 F3 B+10.3V B+10.5V B-10.5V E G TO CONTROL PB H POS VCC (+10.5V) GND VEE (-10.5V) TO AUDIO PB DC volt meter DC volt meter Fig. 13

ITEM	CHECKING METHOD

2 Check of control circuit in dbx circuit

Equipment:
- DC volt meter

E.C.B (G.S.D) voltage check of each switching transistor for Encode/Decode

The terminal voltage of each switching transistor in Encode/Decode mode are shown in the table below.

Transistor Ref. No.	Encode (dbx tape)			Decode (dbx tape)			disc		
	E (G)	C (S)	B (D)	E (G)	C (S)	B (D)	E (G)	C (S)	B (D)
Q15	−10.8V	6.0V	−10.8V	−10.8V	−10.8V	−10.1V	−10.8V	−10.8V	−10.1V
Q16	10.7V	−10.4V	10.6V	10.6V	10.7V	9.9V	−10.7V	−10.2V	−10.6V
Q17, 18	−8.8V	0V	0V	0.6V	0V	0V	0.6V	0V	0V
Q19, 20	0.6V	0V	0V	−8.8V	0V	0V	−8.8V	0V	0V
Q21	−10.8V	−10.8V	−10.1V	−10.8V	10.0V	−10.8V	−10.8V	−10.8V	−10.1V
Q30	0V	0V	0.6V	0V	10.7V	0V	0V	0V	0.6V
Q32	10.7V	10.7V	10.1V	10.7V	−10.7V	10.7V	10.7V	10.7V	10.1V

Transistor Ref. No.	Encode (dbx tape)			Decode (dbx tape)			Transistor Ref. No.	Encode (dbx tape)			Decode (dbx tape)		
	E (G)	C (S)	B (D)	E (G)	C (S)	B (D)		E (G)	C (S)	B (D)	E (G)	C (S)	B (D)
Q201	0V	0V	3.46V	0V	0V	−3.26V	Q213	0.01V	0.04V	0V	0.01V	−0.05V	0V
Q202	0V	0V	−2.6V	0V	0V	−3.22V	Q214	0.01V	0.04V	0V	0.01V	0.02V	0V
Q205	−0.66V	−1.23V	−1.23V	−1.43V	−1.23V	0.01V	Q215	0.04V	0.04V	0.04V	0.03V	0.02V	0.02V
Q206	−2.7V	−1.3V	0V	−3.2V	−1.3V	0V	Q216	0.04V	0V	0V	0.03V	0.02V	0.02V
Q207	−3.36V	−1.23V	0V	−0.66V	−1.23V	−1.23V	Q217	−1.37V	−0.27V	−0.26V	−1.34V	−0.31V	−0.4V
Q208	−0.73V	−1.31V	−1.3V	−0.73V	−1.31V	−1.31V	Q218	−1.29V	0V	−0.02V	−2.3V	0V	−0.06V
Q209, 210	0.01V	0V	0V	0.01V	0V	0V	Q219	0.56V	0V	0V	0.56V	0V	0V
Q211	0.04V	0V	0.04V	0.03V	0V	−0.05V	Q220	0.57V	0V	0V	0.57V	0V	0V
Q212	0.04V	0V	0.02V	0.03V	0V	0.02V	Q223	−10.06V	−2.52V	−10.19V	−10.08V	−2.34V	−10.2V

NOTE:
- If no abnormality is found in steps 1 and 2, check the operation for each part as follows:

3 Operation check of INPUT BAND PASS FILTER circuit (27Hz−20kHz)

Condition:
- Record mode
- Input level controls ··· MAX
- Noise reduction selector ···dbx tape

Equipment:
- VTVM
- AF oscillator
- ATT
- Oscilloscope
- Resistor (600Ω)

1. Make the connections as shown in fig. 14, and apply 100Hz −27dB signal from LINE IN, and set the noise reduction selector to dbx tape position.
2. Set the unit to record mode.
3. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300mV.
4. Make sure that the emitter signal level of Q203 (L-CH) and Q204 (R-CH) is 300mV.
5. Set the input signal frequency to 5kHz and make sure that the emitter signal of Q203 (L-CH) and Q204 (R-CH) remains at the same level (300mV).

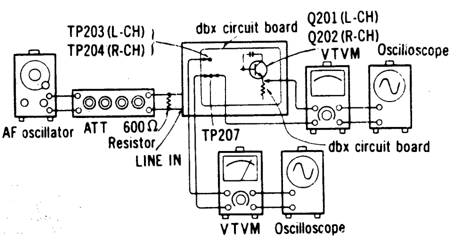

TP203 (L-CH)
TP204 (R-CH)
dbx circuit board
Q201 (L-CH)
Q202 (R-CH)
VTVM
Oscilloscope
AF oscillator
ATT
600Ω
Resistor
LINE IN
TP207
dbx circuit board
VTVM
Oscilloscope

Fig. 14

4 Operation check of VCA circuit and Pre-emphasis/De-emphasis circuit

Condition:
- Stop/record mode
- Input level controls ··· MAX
- Noise reduction selector ··· disc/dbx tape

Equipment:
- VTVM
- AF oscillator
- ATT
- Oscilloscope
- Resistor (600Ω)

4-1 Operation check of VCA circuit and Pre-emphasis circuit

1. Make the connections as shown in fig. 15, and apply 100Hz −27dB signal from LINE IN.
2. Short pin ③ of IC201 (L-CH) and IC202 (R-CH) to TP207 (ground) as shown in fig. 16.
3. Set the unit to record mode, and set the noise reduction selector to dbx tape position.
4. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300mV.
5. Make sure that the output signals at TP203 (L-CH) and TP204 (R-CH) are sinusoidal. (The operation of VCA can then be checked.)
6. Shift the frequency of input signal to 5kHz, and make sure that the output signal levels at TP203 (L-CH) and TP204 (R-CH) are increased by about 12dB. (The operation of the Pre-emphasis circuit can then be checked.)

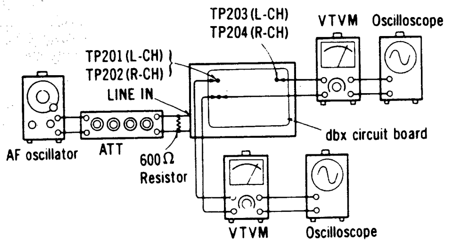

TP203 (L-CH)
TP204 (R-CH)
VTVM
Oscilloscope
TP201 (L-CH)
TP202 (R-CH)
LINE IN
AF oscillator
ATT
600Ω
Resistor
dbx circuit board
VTVM
Oscilloscope

Fig. 15

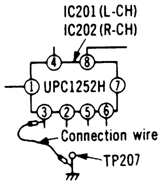
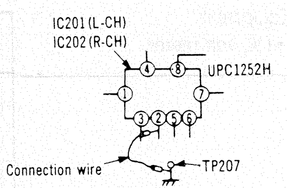
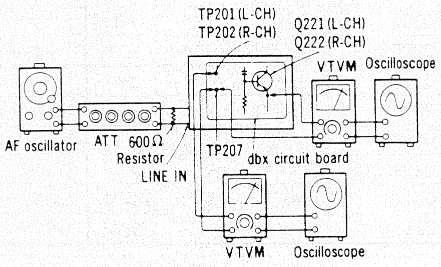
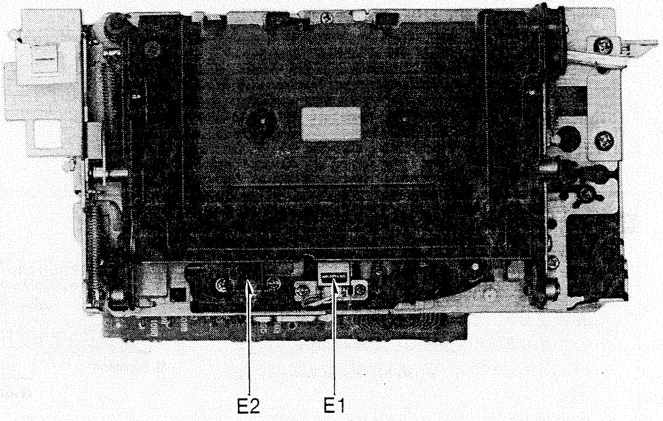
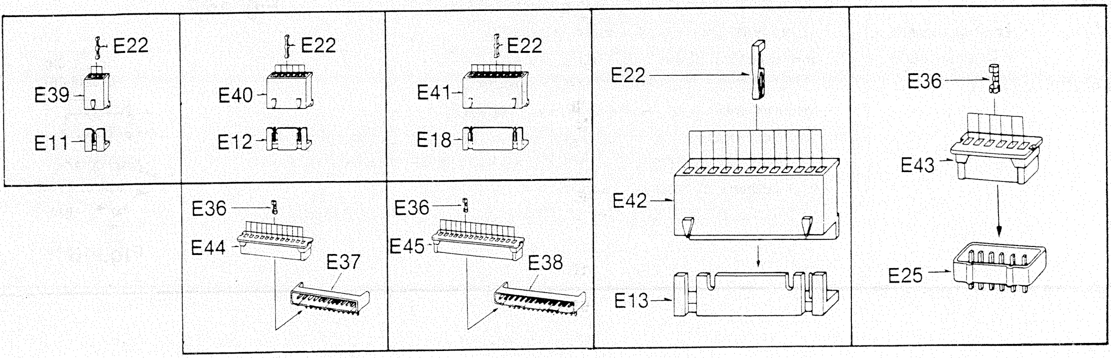

IC201 (L-CH)
IC202 (R-CH)
④
⑧
① UPC1252H ⑦
③②⑤⑥
Connection wire
TP207

Fig. 16

ITEM	CHECKING METHOD
	4-2 Operation check of VCA circuit and De-emphasis circuit 1. The procedure is the same as 1 for the above 4-1 VCA circuit and Pre-emphasis circuit. 2. Short pin ② of IC201 (L-CH) and IC202 (R-CH) to TP207 (ground) as shown in fig. 17. 3. Set the noise reduction selector to disc position. 4. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300 mV. 5. Make sure that the output signals at TP203 (L-CH) and TP204 (R-CH) are sinusoidal. (The operation of VCA can then be checked.) 6. Change the frequency of input signal to 5 kHz and make sure that the output signal level at TP203 (L-CH) and TP204 (R-CH) is decreased by about 12 dB. (The operation of the De-emphasis circuit can then be checked.)  IC201 (L-CH) IC202 (R-CH) UPC1252H 1 2 3 4 5 6 7 8 Connection wire TP207 Fig. 17
5 Operation check of RMS FILTER circuit (27 Hz – 10 kHz) Condition: * Stop mode * Input level controls … MAX * Noise reduction selector … disc Equipment: * VTVM * ATT * Resistor (600 Ω) * AF oscillator * Oscilloscope	1. Make the connections as shown in fig. 18, and apply 100 Hz −27 dB signal from LINE IN. 2. Set the noise reduction selector to disc position. 3. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300 mV. 4. Make sure that the emitter signal level of Q221 (L-CH) and Q222 (R-CH) is around 300 mV. 5. Change the frequency of input signal to 5 kHz and make sure that the emitter signal of Q221 (L-CH) and Q222 (R-CH) remains at the same level (300 mV).  TP201 (L-CH) TP202 (R-CH) Q221 (L-CH) Q222 (R-CH) VTVM Oscilloscope AF oscillator ATT 600 Ω Resistor LINE IN TP207 dbx circuit board VTVM Oscilloscope Fig. 18

ELECTRICAL PARTS LOCATION




E22
E39
E11
E22
E40
E12
E22
E41
E18
E22
E42
E13
E36
E43
E25
E36
E44
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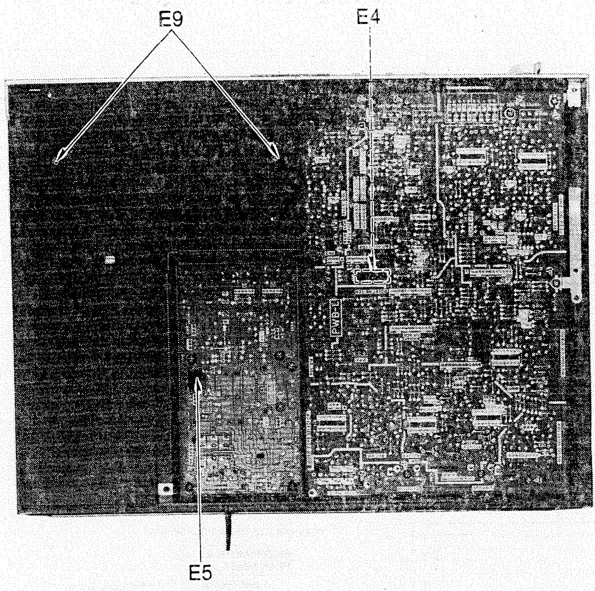
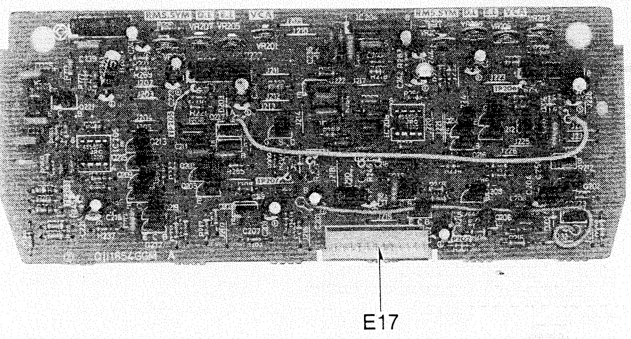
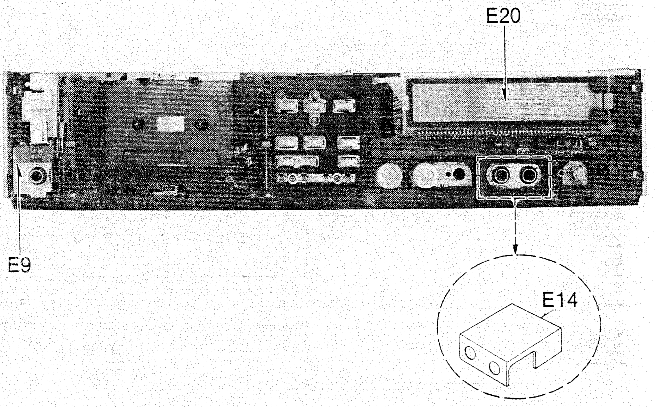
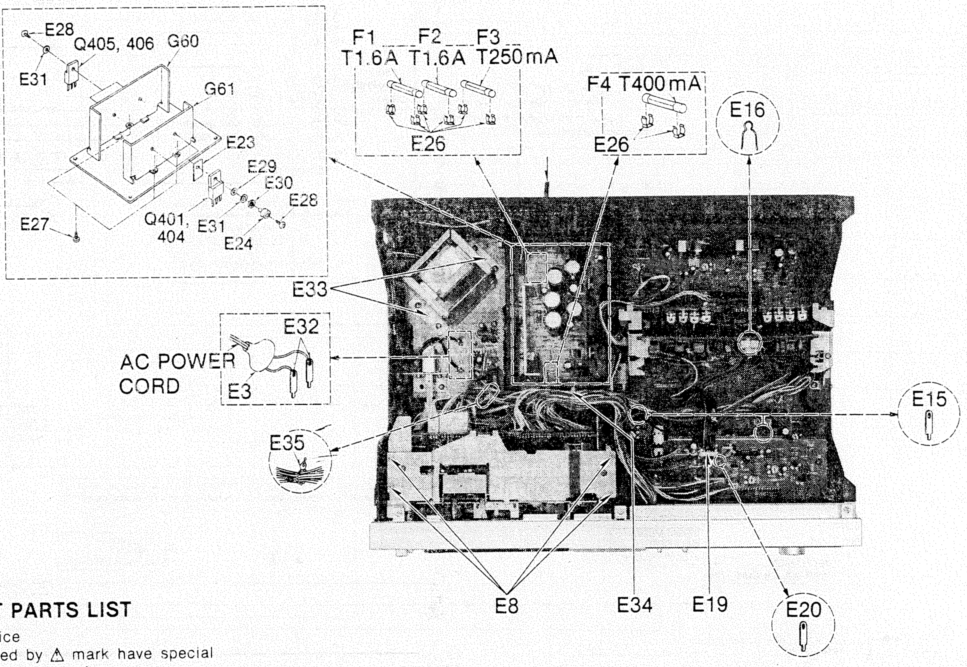
E36
E45
E38









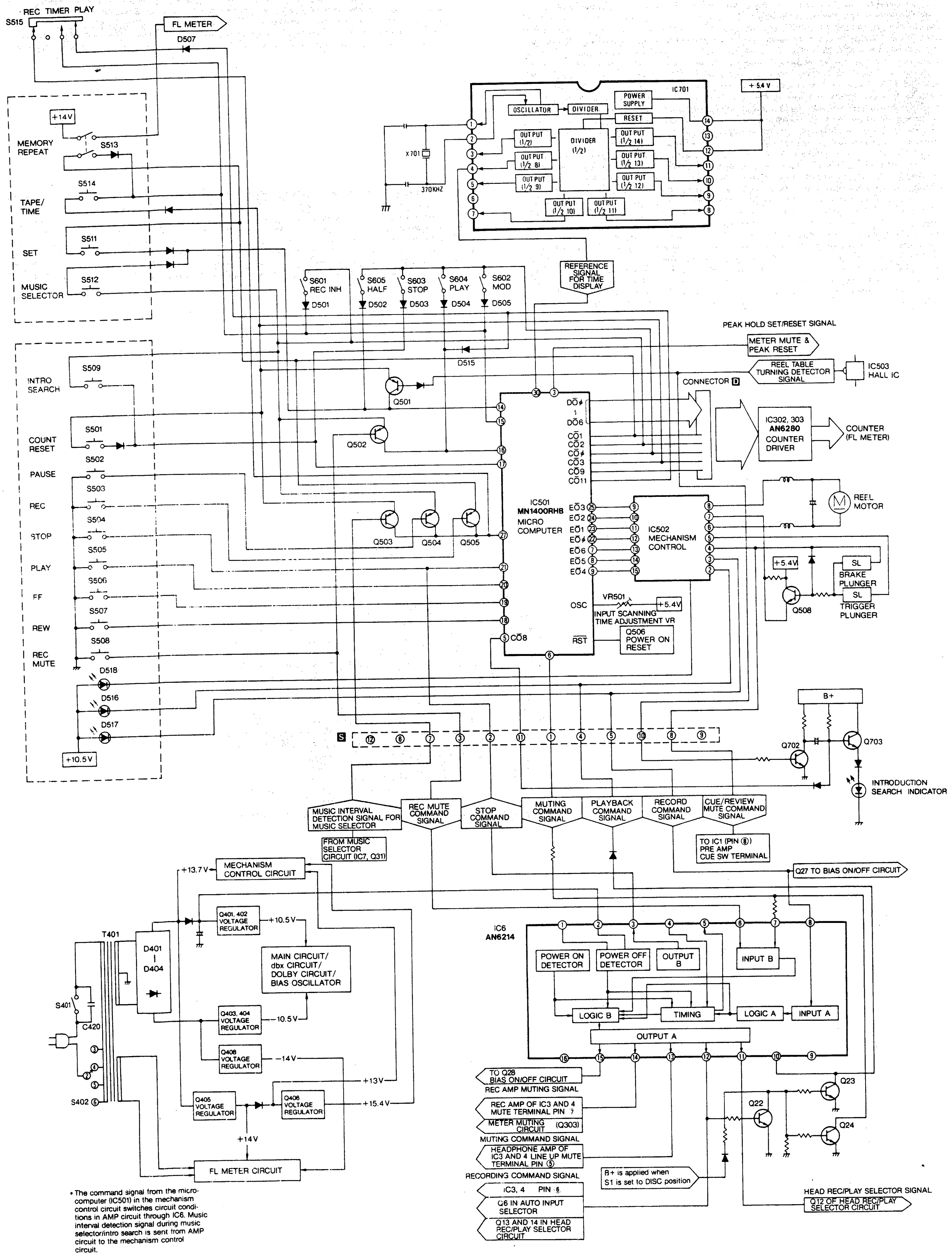
REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

Ref No.	Part No.	Part Name & Description
	ELECTRICAL PARTS	
E 1	QWY4137Z	Record/Playback Head
E 2	QWY2138Z	Erase Head
E 3	QTW1307	Pin Terminal Cover
E 4	QBM1316	Cushion-A
E 5	QBM1317	Cushion-B
E 6	QTD1315	Cord Clamper
E 7	QTW1277	Shield Plate
E 8	XTS3 + 12B	Tapping Screw ⊕3×12
E 9	XTS3 + 10B	Tapping Screw ⊕3×10
E 10 ⚠[D]	SJA88	AC Power Cord
[For all European areas except United Kingdom.]		
⚠[B]	QFC1205M	AC Power Cord
[For United Kingdom.]		
E 11	QJP1921TN	3 Pin Plug
E 12	QJP1922TN	6 Pin Plug
E 13	QJP1924TN	12 Pin Plug
E 14	QTS1579	Shield Plate
E 15	QJT1041	Check Pin-A
E 16	QJT1090	Jumper
E 17	QJS1924TNL	12 Pin Socket (L-Type)
E 18	QJP1923TN	9 Pin Post
E 19	QJS1961S	Jumper Socket
E 20	QJT1067	Check Pin-B
E 21	QSiFM004F	FL Meter
E 22	QJT1054	Contact
E 23	N018E	Insulating Sheet
E 24	N024B	Bushing
E 25	QJP06S001T	6 Pin Post
E 26 ⚠	QTF1054	Fuse Holder
E 27	XTN3 + 10BFZ	Tapping Screw ⊕3×10
E 28	XSN3 + 8S	Screw ⊕3×8
E 29	XWE3	Washer 3ϕ
E 30	XWG3	Washer 3ϕ
E 31	XWA3B	Washer 3ϕ
E 32	SJT777	Pin Terminal
E 33	XTN3 + 8B	Tapping Screw ⊕3×8
E 34	QTD1181	Wire Clamper
E 35	RME144Z	Cord Clamper
E 36	QJT1089	Contact
E 37	QJP12L001T	12 Pin Post (L-Type)
E 38	QJP15L001T	15 Pin Post (L-Type)
E 39	QJS1921TN	3 Pin Socket
E 40	QJS1922TN	6 Pin Socket
E 41	QJS1923TN	9 Pin Socket
E 42	QJS1924TN	12 Pin Socket
E 43	QJS06001T	6 Pin Socket (L-Type)
E 44	QJS12001T	12 Pin Socket (L-Type)
E 45	QJS15001T	15 Pin Socket (L-Type)

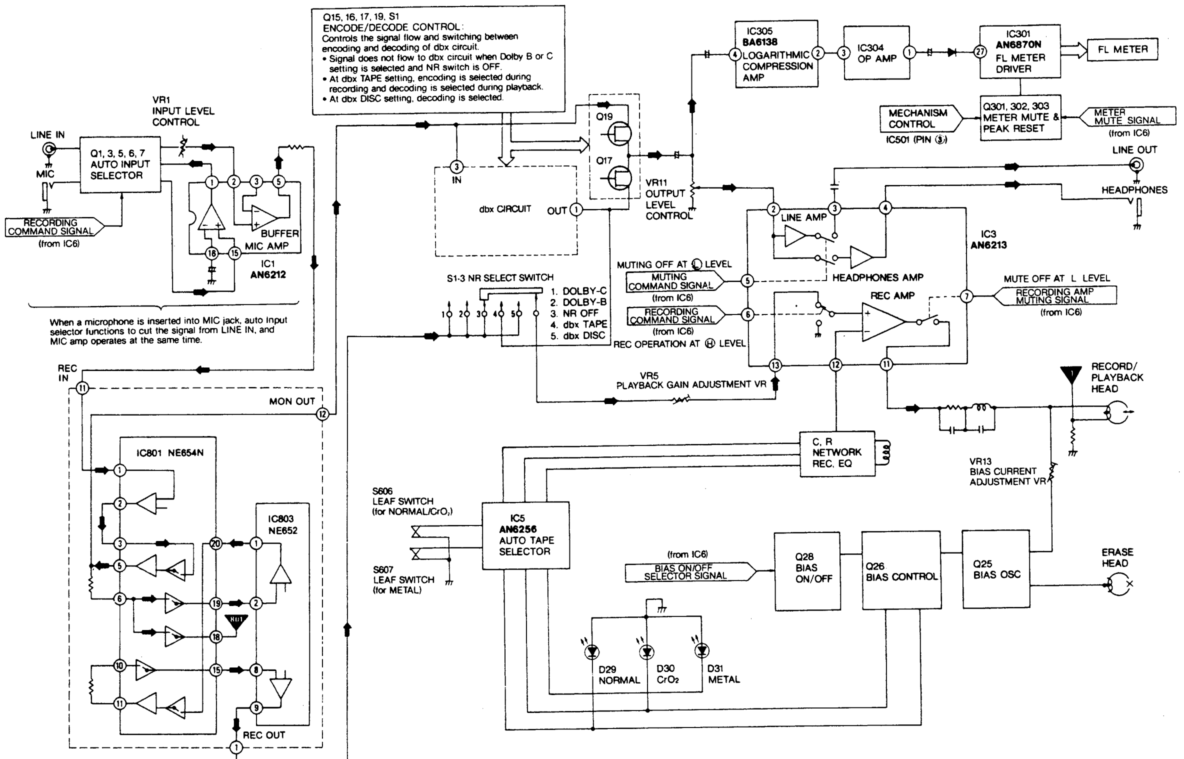
BLOCK DIAGRAM

MECHANISM CONTROL SECTION


REC TIMER PLAY
S515
FL METER
D507
+14V
MEMORY REPEAT
S513
S514
TAPE/ TIME
S511
SET
S512
MUSIC SELECTOR
IC701
OSCILLATOR
DIVIDER
POWER SUPPLY
RESET
OUTPUT (1/2)
DIVIDER (1/2)
OUTPUT (1/2 14)
OUTPUT (1/2 8)
OUTPUT (1/2 13)
OUTPUT (1/2 9)
OUTPUT (1/2 12)
OUTPUT (1/2 10)
OUTPUT (1/2 11)
X701
370KHZ
+5.4V
REFERENCE SIGNAL FOR TIME DISPLAY
S601 REC INH
D501
S605 HALF
D502
S603 STOP
D503
S604 PLAY
D504
S602 MOD
D505
PEAK HOLD SET/RESET SIGNAL
METER MUTE & PEAK RESET
REEL TABLE TURNING DETECTOR SIGNAL
IC503 HALL IC
CONNECTOR D
D515
S509
INTRO SEARCH
Q501
Q502
S501
COUNT RESET
S502
PAUSE
S503
REC
S504
STOP
S505
PLAY
S506
FF
S507
REW
S508
REC MUTE
D518
D516
D517
+10.5V
IC302, 303 AN6280 COUNTER DRIVER
COUNTER (FL METER)
IC501 MN1400RHB MICRO COMPUTER
Q503
Q504
Q505
IC502 MECHANISM CONTROL
REEL MOTOR
+5.4V
SL BRAKE PLUNGER
SL TRIGGER PLUNGER
Q508
VR501
INPUT SCANNING TIME ADJUSTMENT VR
OSC
RST
Q506 POWER ON RESET
B+
Q702
Q703
INTRODUCTION SEARCH INDICATOR
S
MUSIC INTERVAL DETECTION SIGNAL FOR MUSIC SELECTOR
FROM MUSIC SELECTOR CIRCUIT (IC7, Q31)
REC MUTE COMMAND SIGNAL
STOP COMMAND SIGNAL
MUTING COMMAND SIGNAL
PLAYBACK COMMAND SIGNAL
RECORD COMMAND SIGNAL
CUE/REVIEW MUTE COMMAND SIGNAL
TO IC1 (PIN ⑧) PRE AMP CUE SW TERMINAL
Q27 TO BIAS ON/OFF CIRCUIT
+13.7V
MECHANISM CONTROL CIRCUIT
T401
D401 | D404
Q401, 402 VOLTAGE REGULATOR
+10.5V
MAIN CIRCUIT/ dbx CIRCUIT/ DOLBY CIRCUIT/ BIAS OSCILLATOR
Q403, 404 VOLTAGE REGULATOR
-10.5V
Q408 VOLTAGE REGULATOR
-14V
+13V
Q405 VOLTAGE REGULATOR
Q406 VOLTAGE REGULATOR
+15.4V
+14V
FL METER CIRCUIT
S401
C420
S402
IC6 AN6214
POWER ON DETECTOR
POWER OFF DETECTOR
OUTPUT B
INPUT B
LOGIC B
TIMING
LOGIC A
INPUT A
OUTPUT A
TO Q28 BIAS ON/OFF CIRCUIT
REC AMP MUTING SIGNAL
REC AMP OF IC3 AND 4 MUTE TERMINAL PIN 7
METER MUTING CIRCUIT (Q303)
MUTING COMMAND SIGNAL
HEADPHONE AMP OF IC3 AND 4 LINE UP MUTE TERMINAL PIN ⑤
RECORDING COMMAND SIGNAL
IC3, 4 PIN 6
Q6 IN AUTO INPUT SELECTOR
Q13 AND 14 IN HEAD REC/PLAY SELECTOR CIRCUIT
B+ is applied when S1 is set to DISC position
Q22
Q23
Q24
HEAD REC/PLAY SELECTOR SIGNAL
Q12 OF HEAD REC/PLAY SELECTOR CIRCUIT

- The command signal from the micro-computer (IC501) in the mechanism control circuit switches circuit conditions in AMP circuit through IC6. Music interval detection signal during music selector/intro search is sent from AMP circuit to the mechanism control circuit.

RECORDING SYSTEM


LINE IN
MIC
Q1, 3, 5, 6, 7
AUTO INPUT
SELECTOR
RECORDING
COMMAND SIGNAL
(from IC6)
VR1
INPUT LEVEL
CONTROL
BUFFER
MIC AMP
IC1
AN6212
REC
IN
MON OUT
IC801 NE654N
IC803
NE652
REC OUT
IN
dbx CIRCUIT
OUT
Q19
Q17
VR11
OUTPUT
LEVEL
CONTROL
S1-3 NR SELECT SWITCH
1. DOLBY-C
2. DOLBY-B
3. NR OFF
4. dbx TAPE
5. dbx DISC
IC305
BA6138
LOGARITHMIC
COMPRESSION
AMP
IC304
OP AMP
IC301
AN6870N
FL METER
DRIVER
FL METER
MECHANISM
CONTROL
IC501 (PIN ⑬)
Q301, 302, 303
METER MUTE &
PEAK RESET
METER
MUTE SIGNAL
(from IC6)
LINE OUT
HEADPHONES
LINE AMP
IC3
AN6213
MUTING OFF AT Ⓛ LEVEL
MUTING
COMMAND SIGNAL
(from IC6)
HEADPHONES AMP
REC AMP
RECORDING
COMMAND SIGNAL
(from IC6)
REC OPERATION AT Ⓗ LEVEL
MUTE OFF AT L LEVEL
RECORDING AMP
MUTING SIGNAL
(from IC6)
VR5
PLAYBACK GAIN ADJUSTMENT VR
RECORD/
PLAYBACK
HEAD
C, R
NETWORK
REC. EQ
VR13
BIAS CURRENT
ADJUSTMENT VR
S606
LEAF SWITCH
(for NORMAL/CrO₂)
S607
LEAF SWITCH
(for METAL)
IC5
AN6256
AUTO TAPE
SELECTOR
(from IC6)
BIAS ON/OFF
SELECTOR SIGNAL
Q28
BIAS
ON/OFF
Q26
BIAS CONTROL
Q25
BIAS OSC
ERASE
HEAD
D29
NORMAL
D30
CrO₂
D31
METAL

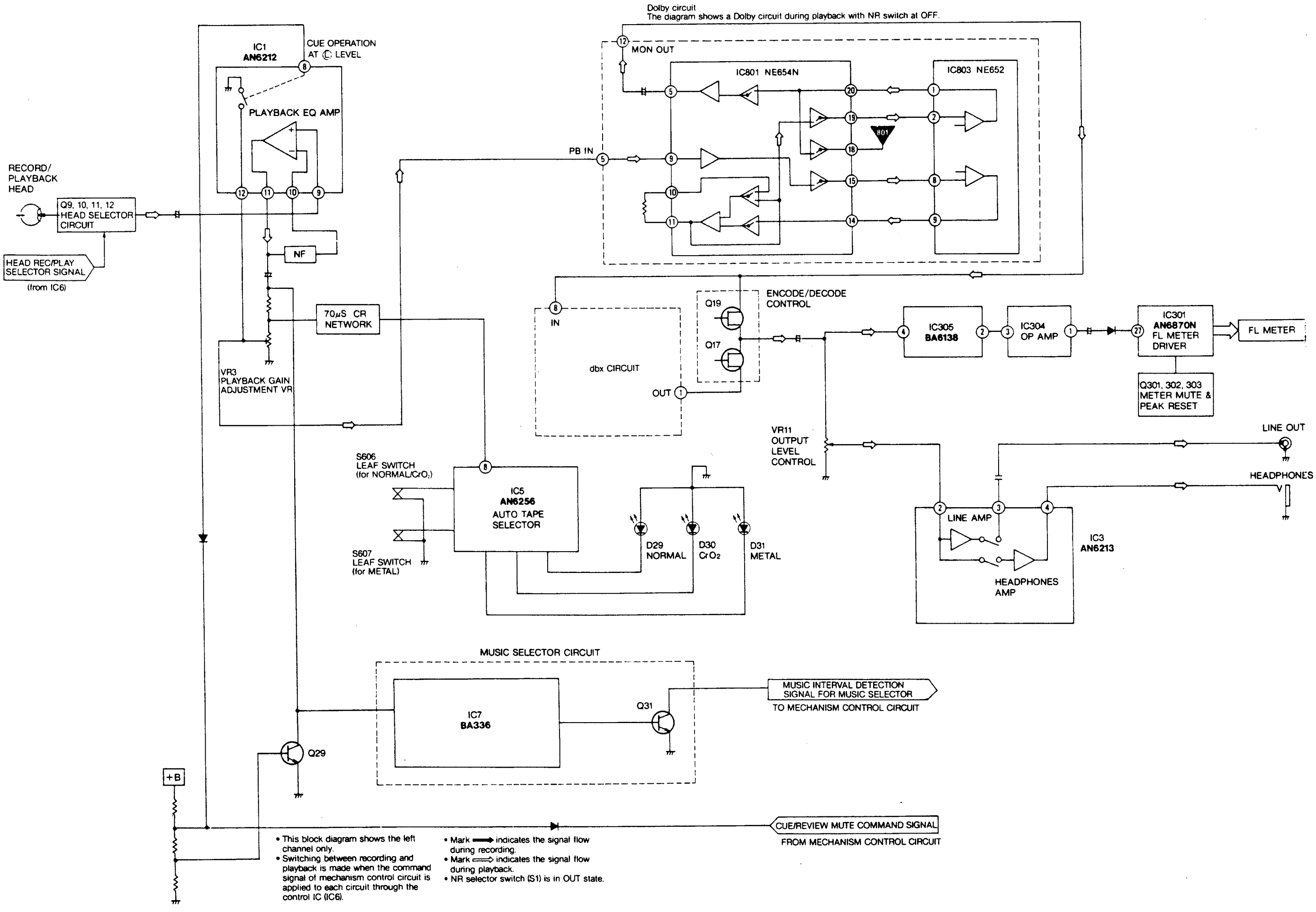
Q15, 16, 17, 19, S1
ENCODE/DECODE CONTROL:
Controls the signal flow and switching between encoding and decoding of dbx circuit.

- Signal does not flow to dbx circuit when Dolby B or C setting is selected and NR switch is OFF.
- At dbx TAPE setting, encoding is selected during recording and decoding is selected during playback.
- At dbx DISC setting, decoding is selected.

When a microphone is inserted into MIC jack, auto input selector functions to cut the signal from LINE IN, and MIC amp operates at the same time.

Dolby circuit
The diagram above shows a Dolby circuit during recording with NR switch at OFF. (This circuit is identical to that of recording mode at dbx TAPE setting and that of dbx DISC setting.)

PLAYBACK SYSTEM


IC1
AN6212
CUE OPERATION
AT Ⓛ LEVEL
PLAYBACK EQ AMP
RECORD/
PLAYBACK
HEAD
Q9, 10, 11, 12
HEAD SELECTOR
CIRCUIT
HEAD REC/PLAY
SELECTOR SIGNAL
(from IC6)
NF
70µS CR
NETWORK
VR3
PLAYBACK GAIN
ADJUSTMENT VR
MON OUT
PB IN
IC801 NE654N
IC803 NE652
ENCODE/DECODE
CONTROL
Q19
Q17
IN
dbx CIRCUIT
OUT
IC305
BA6138
IC304
OP AMP
IC301
AN6870N
FL METER
DRIVER
FL METER
Q301, 302, 303
METER MUTE &
PEAK RESET
VR11
OUTPUT
LEVEL
CONTROL
LINE OUT
HEADPHONES
LINE AMP
IC3
AN6213
HEADPHONES
AMP
S606
LEAF SWITCH
(for NORMAL/CrO₂)
S607
LEAF SWITCH
(for METAL)
IC5
AN6256
AUTO TAPE
SELECTOR
D29
NORMAL
D30
CrO₂
D31
METAL
MUSIC SELECTOR CIRCUIT
IC7
BA336
Q31
MUSIC INTERVAL DETECTION
SIGNAL FOR MUSIC SELECTOR
TO MECHANISM CONTROL CIRCUIT
Q29
+B
CUE/REVIEW MUTE COMMAND SIGNAL
FROM MECHANISM CONTROL CIRCUIT

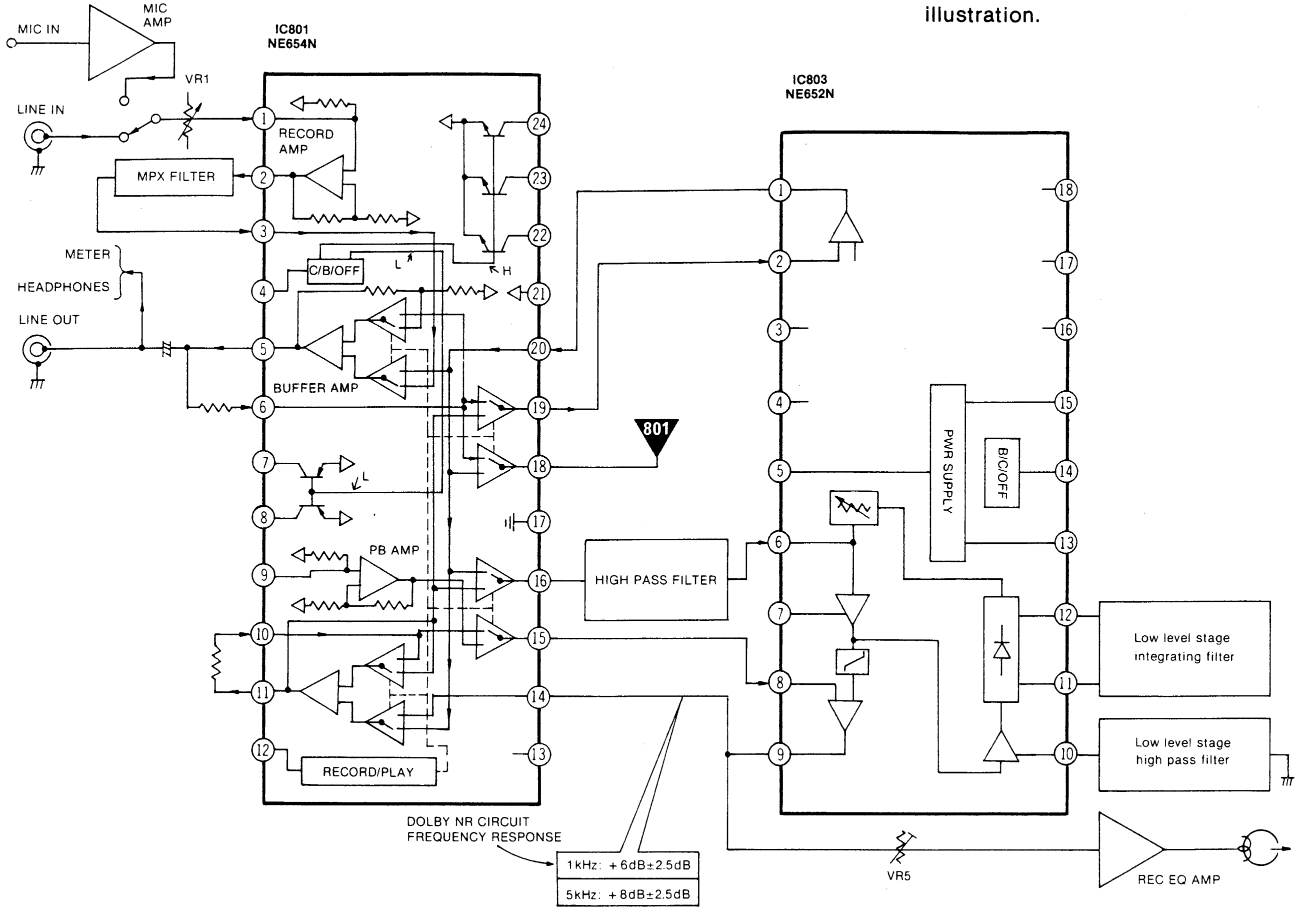
Dolby circuit
The diagram shows a Dolby circuit during playback with NR switch at OFF.

- This block diagram shows the left channel only.
- Switching between recording and playback is made when the command signal of mechanism control circuit is applied to each circuit through the control IC (IC6).
- Mark ➡ indicates the signal flow during recording.
- Mark ⇨ indicates the signal flow during playback.
- NR selector switch (S1) is in OUT state.

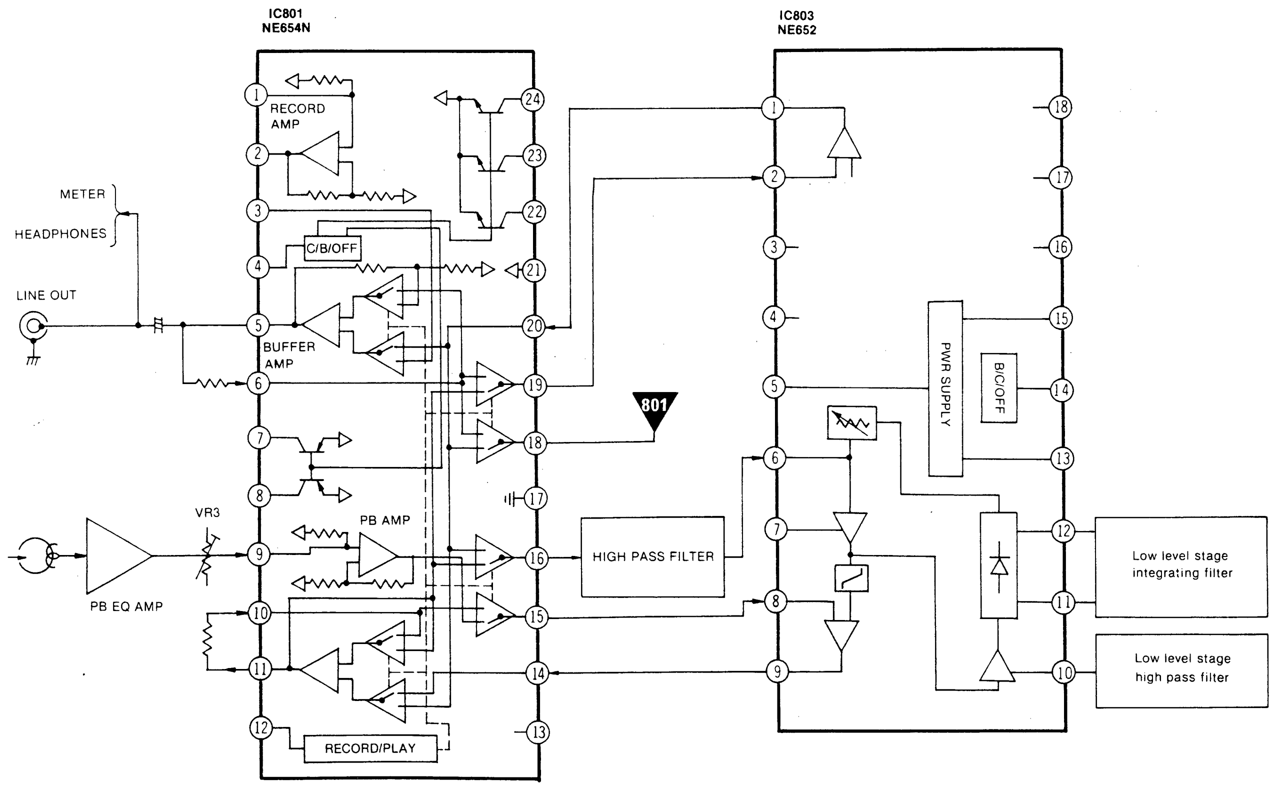
DOLBY SYSTEM (L-CH ONLY)

Dolby-B Encode

Refer to Item 🅘 "Dolby NR circuit" of the measurement and adjustment section to check the frequency response of the Dolby circuit in the illustration.

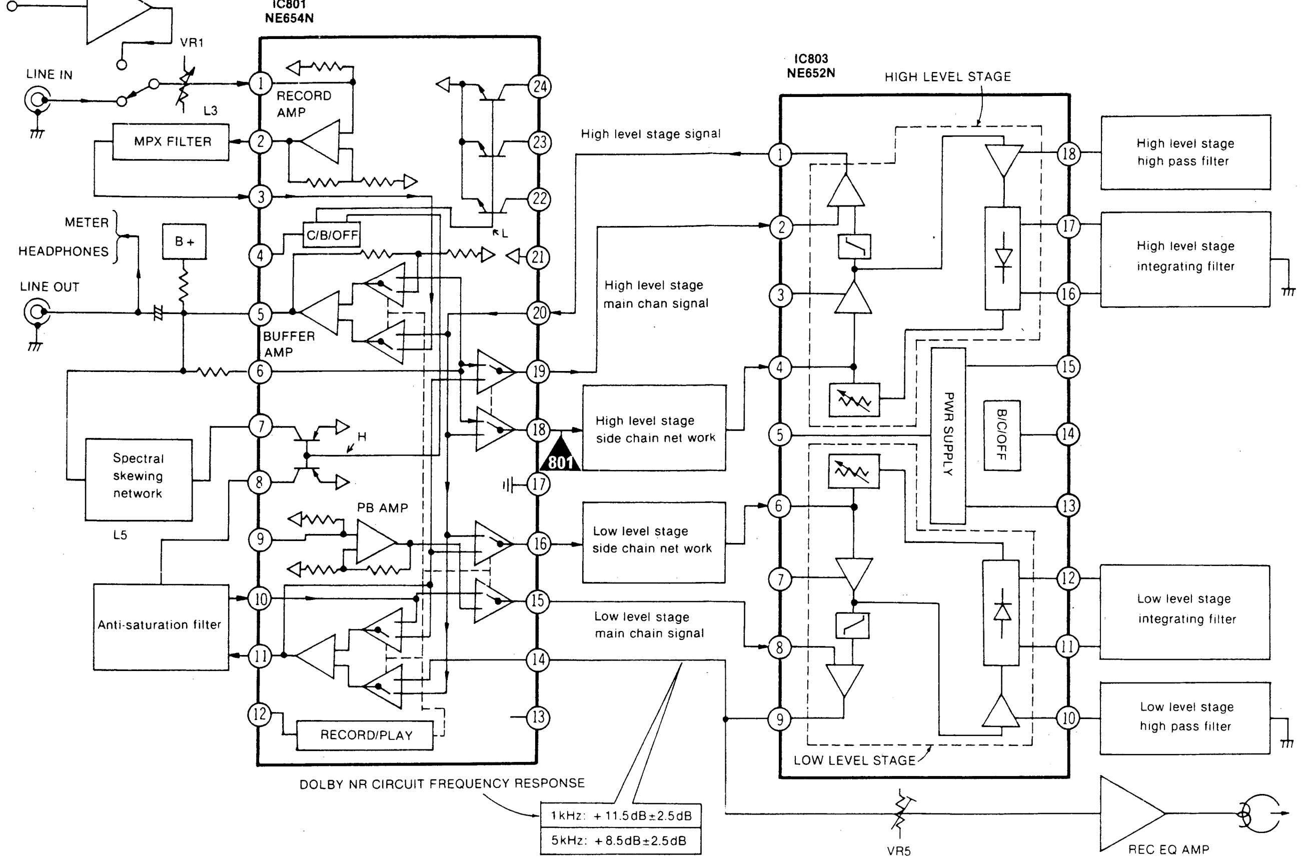

MIC IN
MIC AMP
VR1
LINE IN
MPX FILTER
IC801
NE654N
RECORD AMP
METER
HEADPHONES
LINE OUT
C/B/OFF
L
H
BUFFER AMP
PB AMP
RECORD/PLAY
IC803
NE652N
801
HIGH PASS FILTER
PWR SUPPLY
B/C/OFF
Low level stage integrating filter
Low level stage high pass filter
DOLBY NR CIRCUIT FREQUENCY RESPONSE
1kHz: +6dB±2.5dB
5kHz: +8dB±2.5dB
VR5
REC EQ AMP

Dolby-B Decode

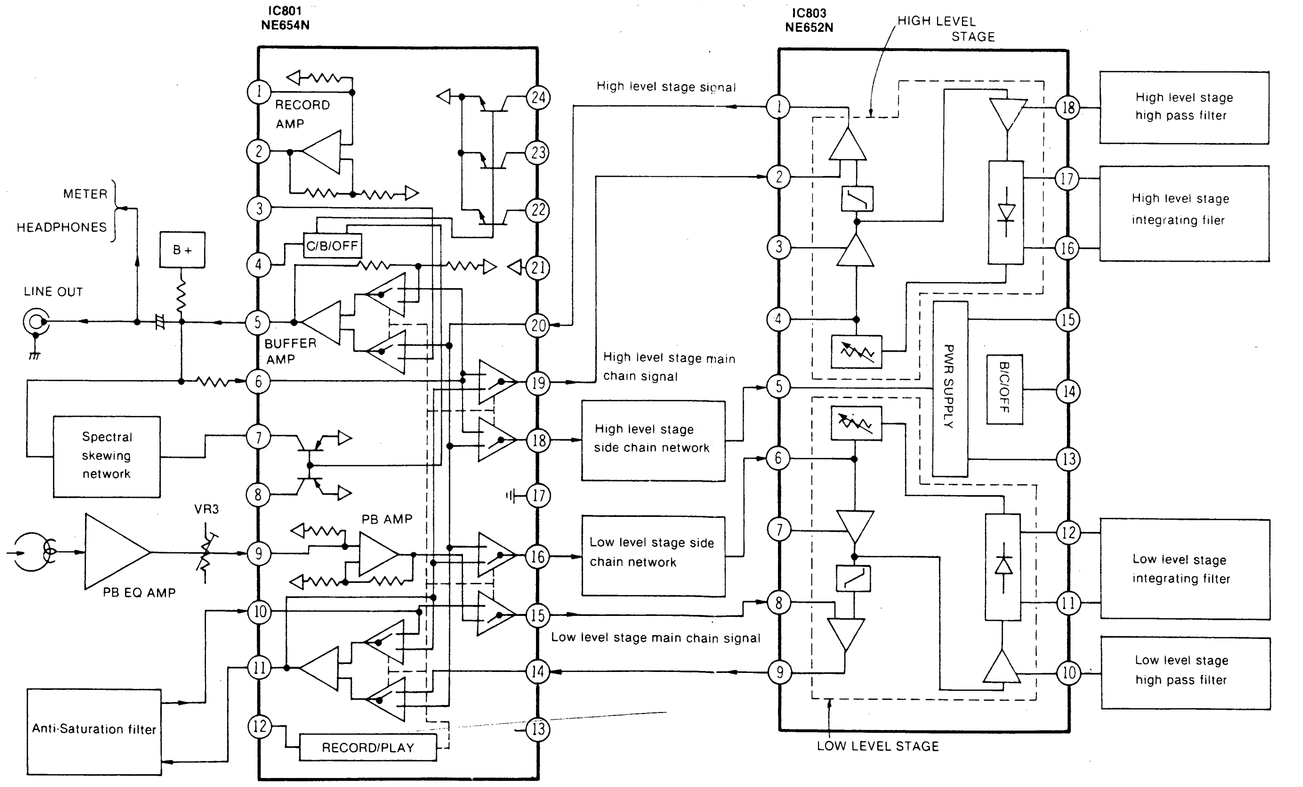

IC801
NE654N
IC803
NE652
RECORD AMP
METER
HEADPHONES
C/B/OFF
LINE OUT
BUFFER AMP
801
PWR SUPPLY
B/C/OFF
VR3
PB AMP
PB EQ AMP
HIGH PASS FILTER
Low level stage integrating filter
Low level stage high pass filter
RECORD/PLAY

Dolby-C Encode

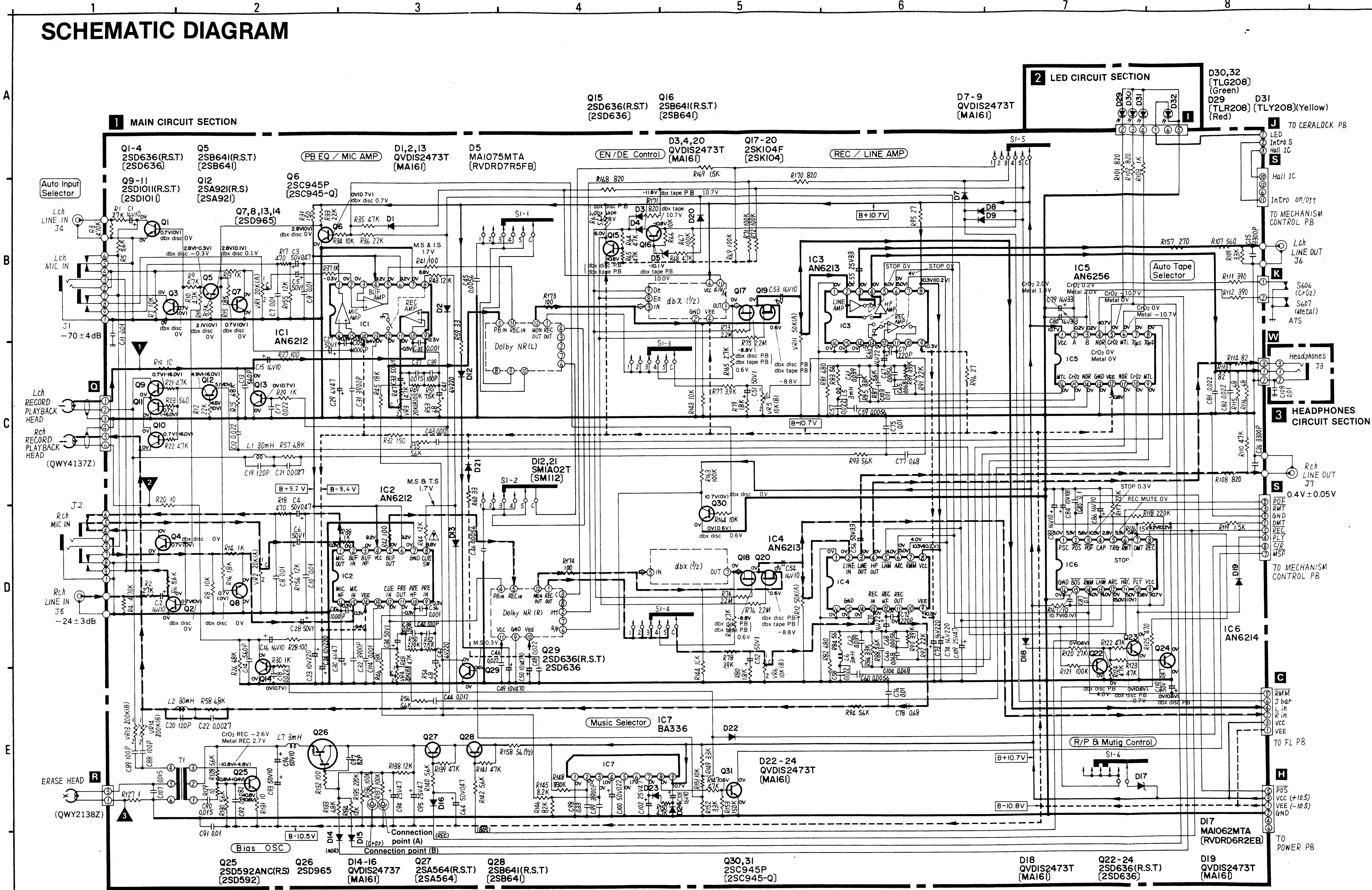
Refer to Item 🅘 "Dolby NR circuit" of the measurement and adjustment section to check the frequency response of the Dolby circuit in the illustration.


MIC IN
MIC AMP
VR1
L3
LINE IN
MPX FILTER
IC801
NE654N
RECORD AMP
METER
HEADPHONES
B+
LINE OUT
C/B/OFF
L
BUFFER AMP
H
Spectral skewing network
L5
PB AMP
Anti-saturation filter
RECORD/PLAY
IC803
NE652N
HIGH LEVEL STAGE
High level stage signal
High level stage main chan signal
High level stage side chain net work
801
Low level stage side chain net work
Low level stage main chain signal
PWR SUPPLY
B/C/OFF
LOW LEVEL STAGE
High level stage high pass filter
High level stage integrating filter
Low level stage integrating filter
Low level stage high pass filter
DOLBY NR CIRCUIT FREQUENCY RESPONSE
1kHz: +11.5dB±2.5dB
5kHz: +8.5dB±2.5dB
VR5
REC EQ AMP

Dolby-C Decode


IC801
NE654N
IC803
NE652N
HIGH LEVEL STAGE
RECORD AMP
High level stage signal
METER
HEADPHONES
B+
C/B/OFF
LINE OUT
BUFFER AMP
High level stage main chain signal
Spectral skewing network
High level stage side chain network
VR3
PB AMP
PB EQ AMP
Low level stage side chain network
Low level stage main chain signal
Anti-Saturation filter
RECORD/PLAY
LOW LEVEL STAGE
PWR SUPPLY
B/C/OFF
High level stage high pass filter
High level stage integrating filer
Low level stage integrating filter
Low level stage high pass filter

SCHEMATIC DIAGRAM


1
2
3
4
5
6
7
8
A
B
C
D
E
F
1 MAIN CIRCUIT SECTION
2 LED CIRCUIT SECTION
3 HEADPHONES CIRCUIT SECTION
Q1-4 2SD636(R.S.T) [2SD636]
Q5 2SB641(R.S.T) [2SB641]
Q9-11 2SD1011(R.S.T) [2SD1011]
Q12 2SA921(R.S) [2SA921]
Q7,8,13,14 [2SD965]
Q6 2SC945P [2SC945-Q]
D1,2,13 QVDIS2473T [MA161]
D5 MA1075MTA [RVDRD7R5FB]
Q15 2SD636(R.S.T) [2SD636]
Q16 2SB641(R.S.T) [2SB641]
D3,4,20 QVDIS2473T [MA161]
Q17-20 2SK104F [2SK104]
D7-9 QVDIS2473T [MA161]
D30,32 [TLG208] (Green)
D29 [TLR208] (Red)
D31 [TLY208] (Yellow)
PB EQ / MIC AMP
EN/DE Control
REC / LINE AMP
Auto Input Selector
Auto Tape Selector
Lch LINE IN J4
Lch MIC IN
J1 −70±4dB
Lch RECORD PLAYBACK HEAD
Rch RECORD PLAYBACK HEAD
(QWY4137Z)
J2
Rch MIC IN
Rch LINE IN J5 −24±3dB
ERASE HEAD
(QWY2138Z)
IC1 AN6212
IC2 AN6212
IC3 AN6213
IC4 AN6213
IC5 AN6256
IC6 AN6214
IC7 BA336
Dolby NR(L)
Dolby NR (R)
dbx (1/2)
D12,21 SMIA02T [SM112]
Q29 2SD636(R.S.T) 2SD636
Music Selector
R/P & Mutig Control
Bias OSC
Connection point (A)
Connection point (B)
B+9.2V
B−9.4V
B+10.7V
B−10.7V
B−10.5V
B−10.8V
TO CERALOCK PB
Lch LINE OUT J6
Rch LINE OUT J7
Headphones J3
TO MECHANISM CONTROL PB
TO FL PB
TO POWER PB
0.4V±0.05V
D22-24 QVDIS2473T [MA161]
D17 MA1062MTA [RVDRD6R2EB]
Q25 2SD592ANC(RS) [2SD592]
Q26 2SD965
D14-16 QVDIS24737 [MA161]
Q27 2SA564(R.S.T) [2SA564]
Q28 2SB641(R.S.T) [2SB641]
Q30,31 2SC945P [2SC945-Q]
D18 QVDIS2473T [MA161]
Q22-24 2SD636(R.S.T) [2SD636]
D19 QVDIS2473T [MA161]

Q26
[2SD946]

	B	C	E
PLAY	−10.8V	−10.8V	−10.8V
Normal	(−5.0V)	(9.3V)	(−3.6V)
CrO_2	(−3.0V)	(8.8V)	(−1.6V)
Metal	(3.2V)	(7.6V)	(4.6V)

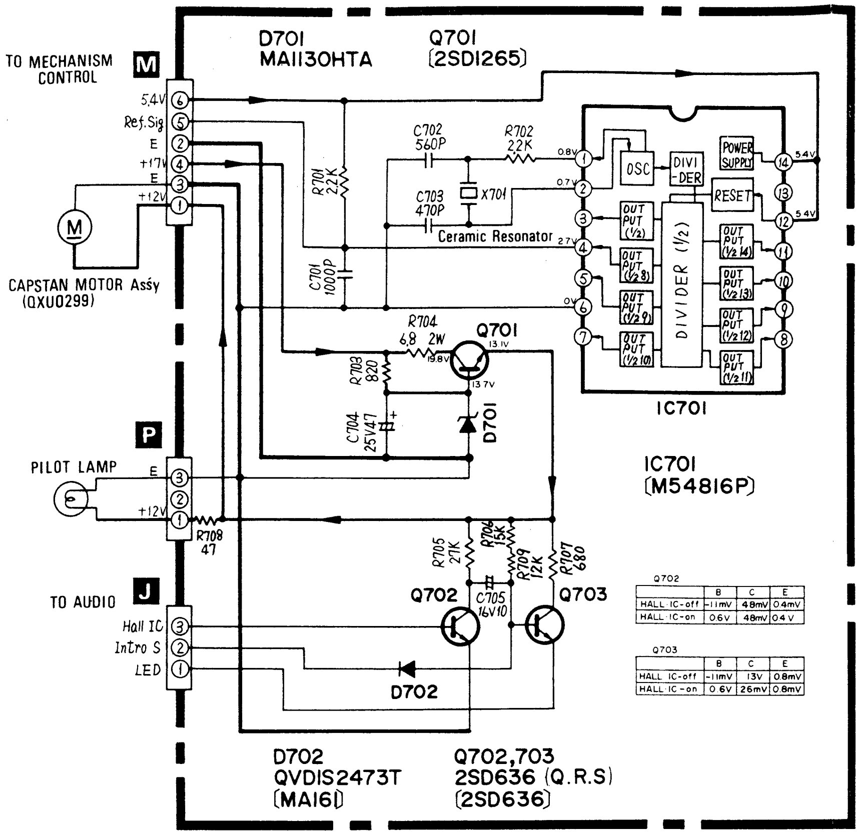
Q27
2SB641RST
[2SB641]

	B	C	E
PLAY	—	−10.8V	—
Normal	(8.6V)	(9.3V)	(9.4V)
CrO_2	(8.2V)	8.2V	(8.9V)
Metal	(7.0V)	(7.6V)	(7.7V)

Q28
2SB641RST
[2SB641]

	B	C	E
PLAY	10.8V	—	10.7V
Normal	(8.6V)	(9.4V)	(9.4V)
CrO_2	(8.2V)	(8.8V)	(8.8V)
Metal	(7.0V)	(7.6V)	(7.6V)

10 CERAMIC LOCK CIRCUIT SECTION


D701
MA1130HTA
Q701
(2SD1265)
TO MECHANISM CONTROL
M
5.4V
Ref.Sig
E
+17V
E
+12V
CAPSTAN MOTOR Ass'y
(QXU0299)
C702 560P
R702 22K
R701 22K
C703 470P
X701
Ceramic Resonator
C701 1000P
R704 6.8 2W
Q701
R703 820
C704 25V47
D701
OSC
DIVI -DER
POWER SUPPLY
RESET
OUT PUT (1/2)
OUT PUT (1/2 8)
OUT PUT (1/2 9)
OUT PUT (1/2 10)
DIVIDER (1/2)
OUT PUT (1/2 14)
OUT PUT (1/2 13)
OUT PUT (1/2 12)
OUT PUT (1/2 11)
IC701
IC701
(M54816P)
P
PILOT LAMP
E
+12V
R708 47
R705 27K
R706 15K
R709 12K
R707 680
TO AUDIO
J
Hall IC
Intro S
LED
Q702
C705 16V10
Q703
D702
D702
QVDIS2473T
(MA161)
Q702,703
2SD636 (Q.R.S)
(2SD636)

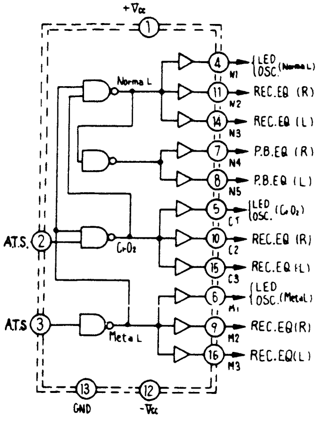
Q702

	B	C	E
HALL·IC-off	-11mV	48mV	0.4mV
HALL·IC-on	0.6V	48mV	0.4 V

Q703

	B	C	E
HALL IC-off	-11mV	13V	0.8mV
HALL·IC-on	0.6V	26mV	0.8mV

IC5 AN6256
(AUTO TAPE SELECTOR)


+Vcc
1
4
N1
LED
OSC. (Normal)
11
N2
REC.EQ (R)
14
N3
REC.EQ (L)
7
N4
P.B.EQ (R)
8
N5
P.B.EQ (L)
5
C1
LED
OSC. (CrO2)
10
C2
REC.EQ (R)
15
C3
REC.EQ (L)
6
M1
LED
OSC. (Metal)
9
M2
REC.EQ(R)
16
M3
REC.EQ(L)
Normal
CrO2
Metal
A.T.S. 2
A.T.S 3
13
GND
12
-Vcc

NOTES:

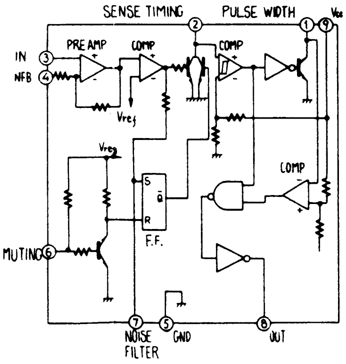
D ········· For all European areas except United Kingdom.

B ········· For United Kingdom.

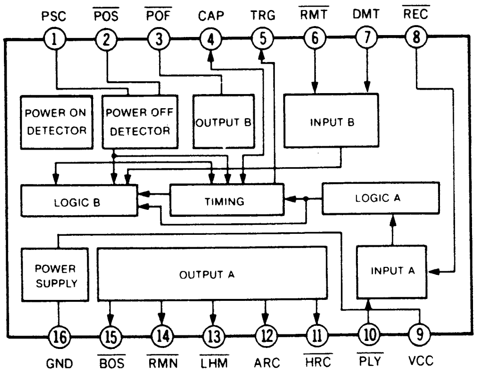
N ········· For Asia, Latin America, Middle East and Africa areas.

EQUIVALENT CIRCUIT

IC7 BA336


SENSE TIMING
PULSE WIDTH
Vcc
IN
NFB
PREAMP
COMP
COMP
Vref
Vreg
S
Q̄
R
F.F.
COMP
MUTING
NOISE FILTER
GND
OUT
1
2
3
4
5
6
7
8
9

IC6 AN6214


PSC
POS
POF
CAP
TRG
RMT
DMT
REC
1
2
3
4
5
6
7
8
POWER ON DETECTOR
POWER OFF DETECTOR
OUTPUT B
INPUT B
LOGIC B
TIMING
LOGIC A
POWER SUPPLY
OUTPUT A
INPUT A
16
15
14
13
12
11
10
9
GND
BOS
RMN
LHM
ARC
HRC
PLY
VCC

SPECIFICATIONS

* Input level controls ···· MAX
* Output level control ··· MAX

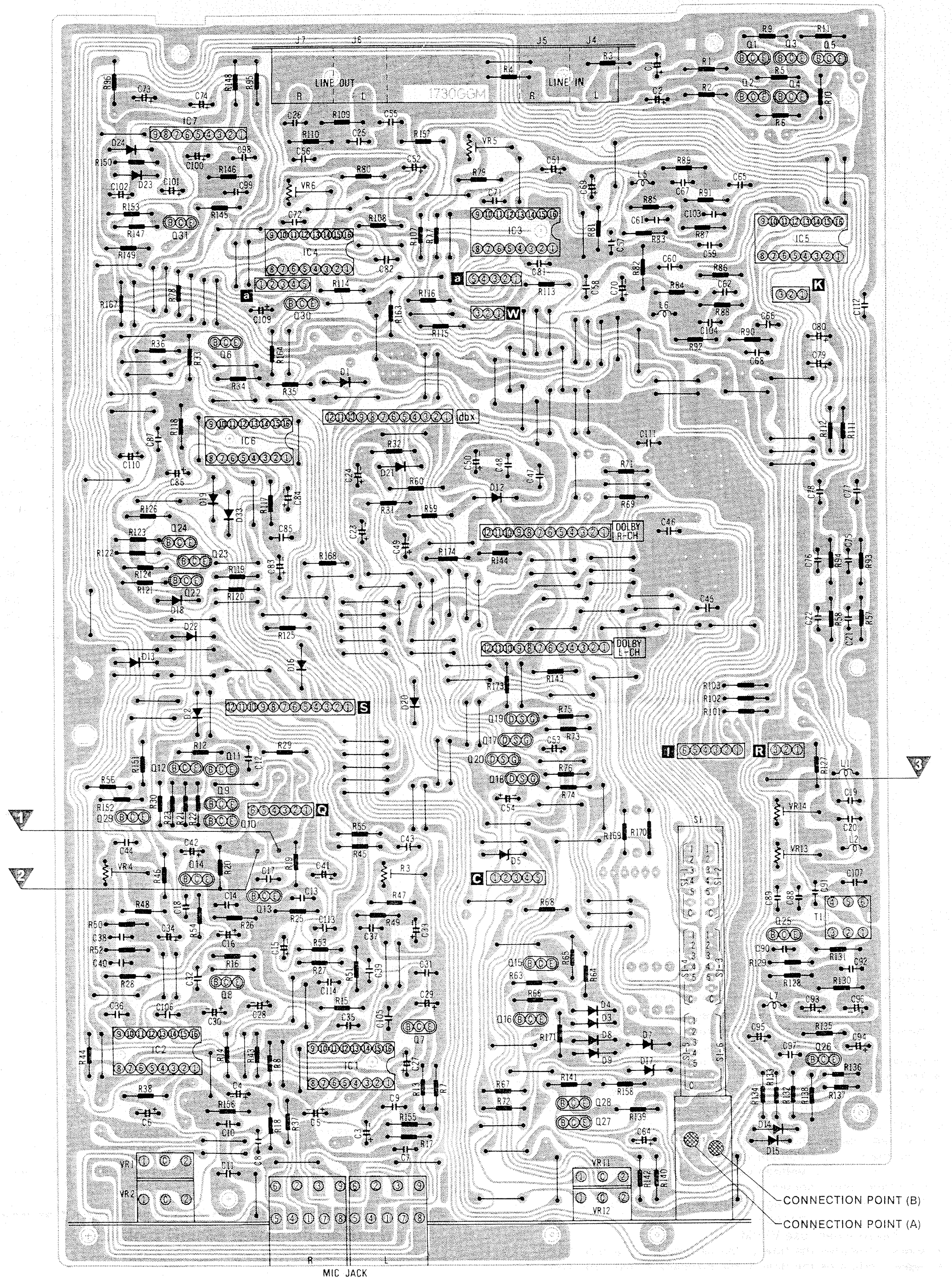
Playback S/N ratio * Test tape ··· QZZCFM	Greater than 45 dB
Overall distortion * Test tape ··· QZZCRA for Normal ··· QZZCRX for CrO2 ··· QZZCRZ for Metal	Less than 3%
Overall S/N ratio * Test tape ··· QZZCRA for Normal ··· QZZCRX for CrO2 ··· QZZCRZ for Metal	Greater than 43 dB (Normal) Greater than 45 dB (CrO2, Metal) (without NAB filter)

NOTES:
- S1-1–S1-6 ..... NR select switch (shown in out position) (1 Dolby-C, 2 Dolby-B, 3 NR OUT, 4 dbx Tape, 5 dbx disc)
- S606.......... Auto tape select switch (For CrO₂/Normal tape)
- S607.......... Auto tape select switch (For Metal tape)
- VR1, 2 .... Input level control
- VR3, 4 .... Playback gain adjustment VR
- VR5, 6 .... Recording gain adjustment VR
- VR11, 12 ...... Output level control
- VR13, 14 ...... Bias current adjustment VR
- Connection point (A), (B)...Bias current adjustment point.
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  1K = 1,000 (Ω), 1M = 1,000 k(Ω).
- Capacity are in micro-farads (μF) unless specified otherwise.
- The mark (▼) shows test point. e.g. ▼ = Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  No mark .... Voltage values at OUT (NR select switch) mode.
  (   ).......... Voltage values at record mode
  dbx disc .... Voltage values at dbx disc mode
  dbx tape .... Voltage values at dbx tape mode
  dbx tape PB..... Voltage values at dbx tape and playback mode
  dbx tape REC.... Voltage values at dbx tape and record mode
  CrO₂............ Voltage values at CrO₂ tape mode
  Metal........... Voltage values at Metal tape mode
  CrO₂ REC .... Voltage values at CrO₂ tape and record mode
  Metal REC ...... Voltage values at Metal tape and record mode
  STOP........... Voltage values at STOP mode
  REC MUTE...... Voltage values at REC MUTE mode
  MS, IS .... Voltage values at Intro Search mode.
  For measurement use VTVM.
- (━▶) indicates the flow of the playback signal.
- (■▶■) indicates the flow of the recording signal.
- (⇨) indicates the flow of the playback signal (dbx tape).
- (▨▶) indicates the flow of the recording signal (dbx tape).
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes.
  One type of number is used for supply parts number and production parts number when they are identical.
  e.g. Q1
  2SC1844(E, F)◀— Production parts number
  [2SC1844E]◀—— Supply parts number
  D212
  1S2473T77◀—— Production parts number
  [MA161]◀—— Supply parts numbers
- The supply parts number is described alone in the replacement parts list.

• This schematic diagram may be modified at any time with the development of new technology.

CIRCUIT BOARDS DIAGRAM

1 MAIN CIRCUIT BOARD



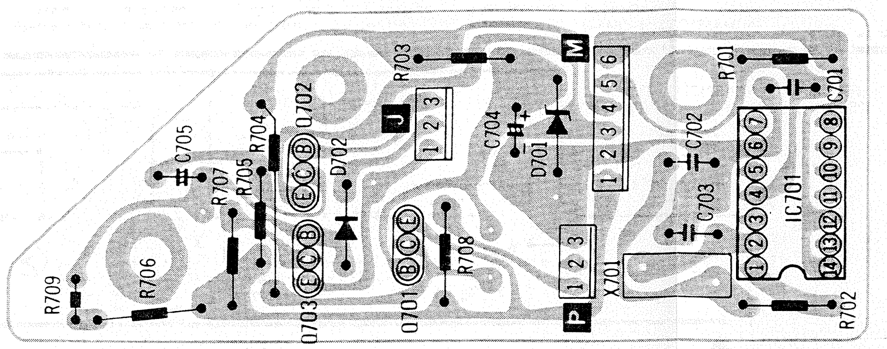
NOTES:

- The circuit shown in ▨ on the conductor side indicates printed circuit on the back side of the printed circuit board.
- Values indicated in ☐ are under no signal condition and playback mode with volume control at minimum position otherwise specified.

No mark .... Voltage values at OUT (NR select switch) mode
(   ) .... Voltage values at record mode
dbx disc .... Voltage values at dbx disc mode
dbx tape .... Voltage values at dbx tape mode
dbx tape PB ..... Voltage values at dbx tape and playback mode
dbx tape REC .... Voltage values at dbx tape and record mode
CrO_2 .... Voltage values at CrO_2 tape mode
Metal .... Voltage values at Metal tape mode
CrO_2 REC .... Voltage values at CrO_2 tape and record mode
Metal REC ...... Voltage values at Metal tape and record mode
STOP........... Voltage values at STOP mode
REC MUTE ...... Voltage values at REC MUTE mode
MS.IS .... Voltage values at Intro Search mode
For measurement use VTVM.

- **This schematic diagram may be modified at any time with the development of new technology.**

10 CERAMIC LOCK CIRCUIT BOARD



IC1, 2
[AN6212]

1	−0.3V
2	0V
3	0V
4	9.2V
5	0V
6	9.2V
7	0V
8	8.8V
9	−0.3V
10	−0.3V
11	0V
12	0V
13	0V
14	−9.4V
15	−0.3V
16	−0.3V

IC3
[AN6213]

1	0V
2	0V
3	0V
4	0V
5	4V STOP 0V
6	0V (5.0V)
7	4V STOP 0V
8	10.3V (10.2V)
9	−10.3V
10	0V
11	0V
12	0V
13	0V
14	0V
15	0V
16	0V

IC4
[AN6213]

1	0V
2	0V
3	0V
4	0V
5	4.0V
6	0V (5.0V)
7	4.0V
8	10.3V (10.2V)
9	−10.3V
10	0V
11	0V
12	0V
13	0V
14	0V
15	0V
16	0V

IC5
[AN6256]

1	10.7V		
2	0.2V	CrO_2 Metal	2.0V 1.0V
3	0.2V	CrO_2 Metal	0.2V 2.0V
4	−10.7V	CrO_2 Metal	0V 0V
5	0V	CrO_2 Metal	−10.7V 0V
6	0V	CrO_2 Metal	0V −10.7V
7	0V		
8	0V		
9	0V		
10	0V		
11	0V		
12	−10.8V		
13	0V		
14	0V		
15	0V		
16	0V		

IC6
[AN6214]

1	5.0V
2	5.3V
3	5.6V
4	10.5V STOP 0.3V
5	2.8V
6	5.5V REC MUTE ON 0V
7	0.4V STOP 5.3V
8	9.2V (0.2V)
9	10.7V
10	0.6V STOP 1.8V
11	5.0V (0V)
12	0V (5.0V)
13	4.0V STOP 0V
14	4.0V STOP REC MUTE ON 0V
15	10.7V (0.1V)
16	0V

IC7
[BA336]

1	0V
2	0V
3	0V
4	1.0V
5	0V
6	1.7V
7	0V
8	0V
9	10.7V

Q1, 2, 3, 4
[2SD636]

B	0.7V (0V) dbx disc 0V
C	0V
E	0V

Q5
[2SC945-Q]

B	2.1V (0V) dbx disc 0V
C	2.8V (−0.3V) dbx disc −0.3V
E	2.8V (0.1V) dbx disc 0.1V

Q6
[2SD636]

B	0V (0.7V) dbx disc 0.7V
C	2.8V (0V) dbx disc 0V
E	0V

Q7, 8
[2SD965]

B	0.7V (0V) dbx disc 0V
C	0V
E	0V

Q9, 10, 11
[2SD1011]

B	0.7V (−16.0V)
C	0V
E	0V

Q12
[2SA921]

B	4.6V (0V)
C	4.9V (−16.0V)
E	5.1V (0V)

Q13, 14
[2SD965]

B	0V (0.7V)
C	0V
E	0V

Q15
[2SD636]

B	−10.8V dbx disc dbx tape P.B −10.1V
C	6.0V dbx disc dbx tape P.B −10.8V
E	−10.8V

Q16
[2SB641]

B	−10.8V dbx tape P.B 10.0V
C	−11.6V dbx tape P.B 10.7V
E	−10.8V dbx tape P.B 10.7V

Q17, 18
[2SK104]

G	−8.8V dbx disc dbx tape P.B 0.6V
S	0V
D	0V

Q19, 20
[2SK104]

G	0.6V dbx disc dbx tape P.B −8.8V
S	0V
D	0V

Q21
[2SD636]

B	−10.8V (−10.1V) dbx disc −10.1V
C	10.0V (−10.8V) dbx disc −10.8V
E	−10.8V (−10.8V)

Q22
[2SD636]

B	0V (0.6V)
C	0V dbx disc 4.0V
E	0V

Q23
[2SD636]

B	0V (0.6V) dbx disc 0.7V
C	0V
E	0V

Q24
[2SD636]

B	0V (0.6V) dbx disc 0.7V
C	0V
E	0V

Q25
[2SD592]

B	−10.8V (−10.4V)
C	−10.8V (−4.8V) CrO_2 (−2.6V) Metal (2.7V)
E	−10.8V (−10.6V)

Q26
[2SD592]

	B	C	E
PLAY	−10.8V	−10.8V	−10.8V
Normal	(−3.3V)	(9.3V)	(−4.6V)
CrO_2	(−1.0V)	(8.8V)	(−2.3V)
Metal	(4.5V)	(7.6V)	(3.1V)

Q27
[2SB641]

	B	C	E
PLAY	—	−10.8V	—
Normal	(8.6V)	(9.3V)	(9.4V)
CrO_2	(8.2V)	(8.8V)	(8.9V)
Metal	(7.0V)	(7.6V)	(7.7V)

Q28
[2SB641]

	B	C	E
PLAY	10.8V	—	10.7V
Normal	(8.6V)	(9.4V)	(9.4V)
CrO_2	(8.2V)	(8.8V)	(8.8V)
Metal	(7.0V)	(7.6V)	(7.6V)

Q29
[2SD636]

B	0.6V
C	0V
E	0V

Q30
[2SC945-Q]

B	0V (0.6V) dbx disc 0.6V
C	10.7V (0V) dbx disc 0V
E	0V

Q31
[2SC945-Q]

B	0V
C	0V
E	0.6V

Q32
[2SB641]

B	10.7V (10.1V) dbx disc 10.1V
C	−10.7V (10.7V) dbx disc 10.7V
E	10.7V

Q33
2SD636RST
[2SD636]

B	0.6V
C	9.2V
E	0.2V

Q34
2SD636RST
[2SD636]

B	0.6V
C	0V
E	0V

Q701

B	13.7V
C	19.8V
E	13.1V

Q702 [2SD636]

	HALL IC-off	HALL IC-on
B	−11mV	0.6V
C	48mV	48mV
E	0.4V	0.4V

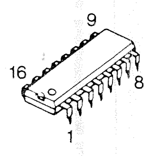
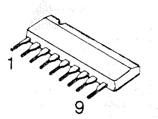
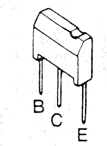
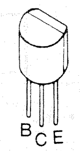
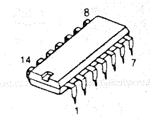
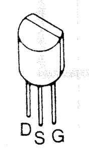
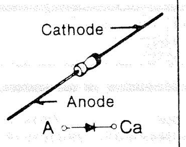
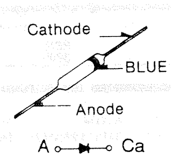
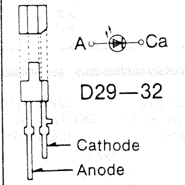
Q703 2SD636

	HALL IC-off	HALL IC-on
B	−11mV	0.6V
C	13V	26mV
E	0.8mV	0.8mV

IC701
M54816P

1	0.8V
2	0.7V
3	—
4	2.7V
5	—
6	0V
7	—
8	—
9	—
10	—
11	—
12	5.4V
13	—
14	5.4V

TERMINATIONS

 IC1—6	 IC7	 Q1—6, 15, 16, 21—24, 26—34, 702, 703	 Q7—14, 25	 IC 701
 Q17—20	 D1—5, 7—9, 13—20, 22—24, 33, 701—703	 D12, 21	 D29—32	

NOTES: RESISTORS
ERD.........Carbon
ERG ......Metal-oxide
ERS.........Metal-oxide
ERO ......Metal-film
ERX.........Metal-film
ERQ ......Fuse type metallic
ERC.........Solid
ERF.........Cement

CAPACITORS
ECBA ......Ceramic
ECG□ ......Ceramic
ECK□ ......Ceramic
ECC□ ......Ceramic
ECF□ ......Ceramic
ECQM ......Polyester film
ECQE ......Polyester film
ECQF ......Polypropylene

ECE□ ......Electrolytic
ECE□N ...Non polar electrolytic
ECQS ......Polystyrene
ECS□ ......Tantalum
QCS ......Tantalum

REPLACEMENT PARTS LIST

Important safety notice
Components identified by △ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

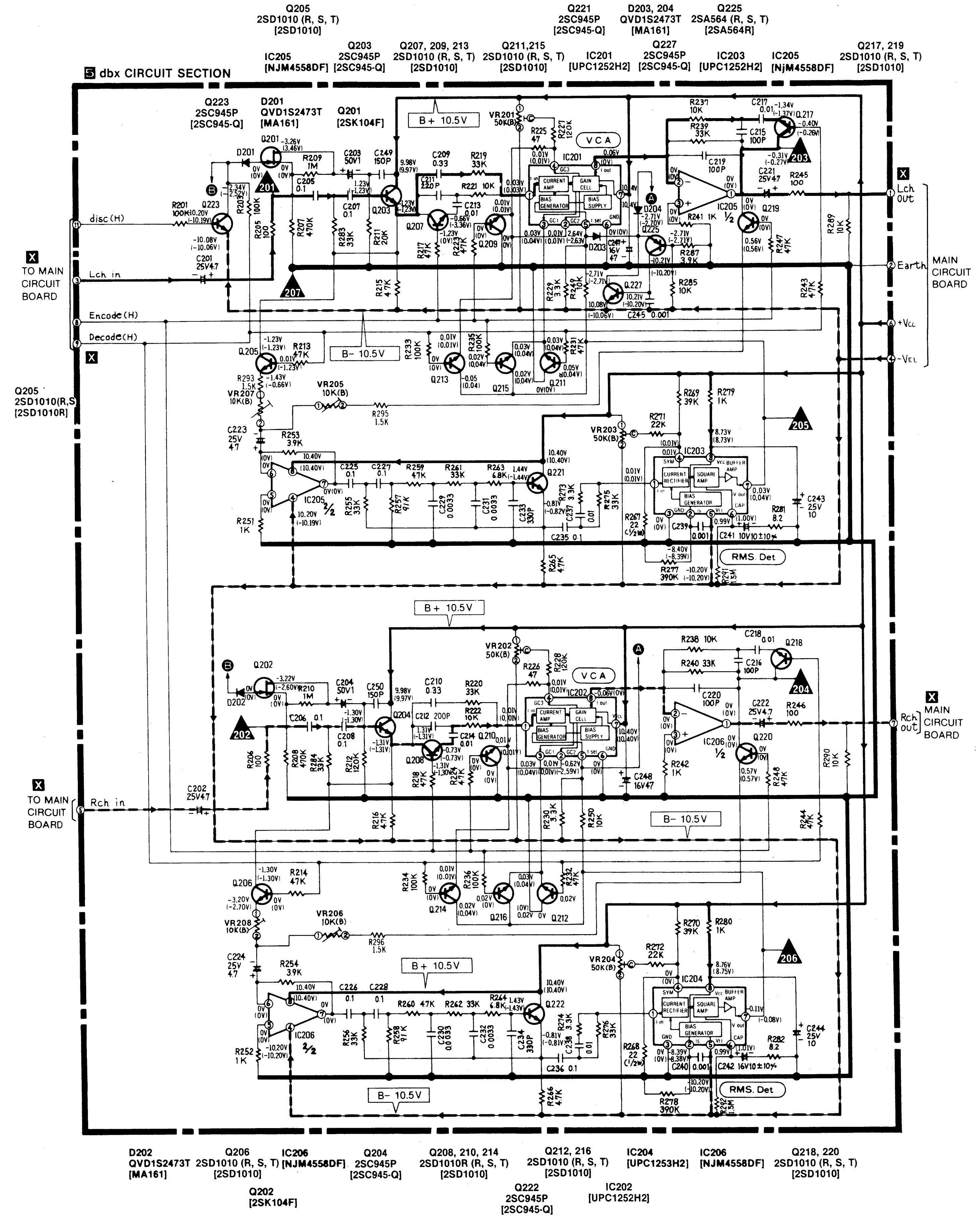
Ref No.	Part No.
RASISTORS	
R 1, 2	ERD25TJ273
R 3, 4	ERD25TJ474
R 5, 6	ERD25FJ562
R 7, 8	ERD25FJ103
R 9, 10	ERD25FJ472
R 11	ERD25FJ822
R 12	ERD25TJ223
R 13, 14	ERD25FJ102
R 15, 16	ERD25FJ182
R 17, 18	ERD25FJ471
R 19, 20	ERD25FJ100
R 21, 22	ERD25FJ472
R 23	ERD25FJ561
R 25, 26	ERD25TJ683
R 27, 28	ERD25FJ101
R 29, 30	ERD25FJ102
R 31, 32	ERQ14AJ151
R 33	ERD25FJ222
R 34	ERD25FJ103
R 35	ERD25FJ473
R 36	ERD25TJ223
R 37, 38	ERD25FJ102
R 41, 42	ERD25FJ101
R 43, 44	ERD25TJ123
R 45, 46	ERD25TJ183
R 47, 48	ERD25FJ472
R 49, 50	ERD25TJ224
R 51, 52	ERD25FJ752
R 53, 54	ERD25FJ680
R 55, 56	ERD25FJ562
R 57, 58	ERD25FJ682
R 59, 60	ERQ14AJ330
R 63	ERD25FJ562
R 64, 65	ERD25TJ473
R 66	ERD25FJ103
R 67	ERD25TJ104
R 68	ERD25FJ472
R 69, 71, 72	ERD25TJ104
R 73, 74, 75, 76	ERD25TJ225
R 77, 78	ERD25FJ392
R 79, 80	ERD25FJ182
R 81, 82	ERD25FJ681
R 83, 84	ERD25FJ560
R 85, 86	ERD25FJ332
R 87, 88	ERD25FJ562
R 89, 90	ERD25FJ392
R 91, 92	ERD25FJ222
R 93, 94	ERD25FJ562
R 95, 96	ERQ14AJ270
R 101, 102	ERD25FJ821
R 103	ERD25FJ102
R 107	ERD25FJ561
R 108	ERD25FJ821
R 109, 110	ERD25TJ473
R 111, 112	ERD25FJ391
R 113, 114	ERD25FJ820
R 115, 116	ERD25FJ680
R 117	ERD25TJ223
R 118	ERD25TJ224
R 119	ERD25FJ152
R 120	ERD25TJ273
R 121	ERD25TJ104
R 122, 123, 124	ERD25TJ473
R 125	ERD25FJ471
R 126	ERD25FJ152
R 127	ERD25FJ1R0
R 128	ERD25FJ562
R 129	ERD25FJ100
R 130	ERD25FJ562
R 131	ERD25FJ100
R 132	ERD25FJ101
R 133	ERD25FJ682
R 134	ERD25TJ123
R 135	ERD25TJ224
R 136, 137	ERD25TJ104
R 138	ERD25TJ123
R 139	ERD25TJ473
R 140	ERD25FJ562
R 141	ERD25TJ473
R 142	ERD25FJ562
R 143, 144	ERD25FJ103
R 145, 146	ERD25FJ822
R 147	ERD25TJ473
R 148	ERD25TJ334
R 149	ERD25FJ332
R 150	ERD25FJ472
R 151	ERD25FJ103
R 152	ERD25FJ332
R 153	ERD25TJ154
R 155, 156	ERD25TJ123
R 157	ERD25FJ271
R 158	ERD50FJ560
R 163	ERD25TJ104
R 164	ERD25FJ103
R 165, 166	ERD25FJ272
R 167	ERQ14AJ100
R 168	ERD25FJ821
R 169	ERD25FJ152
R 170, 171	ERD25FJ821
R 173, 174	ERD25FJ101
R 201, 203	ERD25TJ104
R 205, 206	ERD25FJ101
R 207, 208	ERD25TJ474
R 209, 210	ERD25TJ105
R 211, 212	ERD25TJ124
R 213, 214	ERD25TJ473
R 215, 216	ERD25FJ472
R 217, 218	ERD25TJ473
R 219, 220	ERD25TJ333
R 221, 222	ERD25FJ103
R 223, 224	ERD25TJ473
R 225, 226	ERD25FJ470
R 227, 228	ERD25TJ124
R 229, 230	ERD25FJ332
R 231, 232	ERD25TJ473
R 233, 234, 235, 236	ERD25TJ104
R 237, 238	ERD25FJ103
R 239, 240	ERD25TJ333
R 241, 242	ERD25FJ102
R 243, 244	ERD25TJ473
R 245, 246	ERD25FJ101
R 247, 248	ERD25TJ473
R 249, 250	ERD25FJ103
R 251, 252	ERD25FJ102
R 253, 254	ERD25FJ392
R 255, 256	ERD25TJ333
R 257, 258	ERD25FJ913
R 259, 260	ERD25FJ472
R 261, 262	ERD25TJ333
R 263, 264	ERD25FJ682
R 265, 266	ERD25FJ472
R 267, 268	ERQ12HJ220
R 269, 270	ERD25TJ393
R 271, 272	ERD25TJ223
R 273, 274	ERD25FJ332
R 275, 276	ERD25TJ333
R 277, 278	ERD25TJ394
R 279, 280	ERD25FJ102
R 281, 282	ERD25FJ8R2
R 283, 284	ERD25TJ333
R 285	ERD25FJ103
R 287	ERD25FJ392
R 289, 290	ERD25FJ103
R 291, 292	ERD25TJ155
R 293, 295, 296	ERD25FJ152
R 301, 302, 303, 304	ERD25FJ471
R 305	ERG1ANJ221
R 306, 307	ERD25TJ473
R 309	ERD25TJ223
R 310	ERD25TJ104
R 311	ERD25TJ473
R 312	ERD25FJ183
R 314	ERD25FJ182
R 315	ERD25FJ102
R 316	ERD25FJ103
R 317, 318	ERD25FJ472
R 319, 320	ERD25TJ154
R 321, 322	ERD25TJ683
R 323, 324	ERD25TJ563
R 325, 326	ERD25TJ224
R 327, 328	ERD25FJ222
R 329	ERQ12HJ100
R 330, 331	ERD25FJ562
R 333	ERD25TJ104
R 336	ERD25FJ332
R 337, 338	ERD25TJ684
R 339, 340	ERD25FJ562
R 401	ERD25FJ681
R 402	ERD25TJ183
R 403 ⚠	ERQ12AJ2R7
R 404	ERD25FJ102
R 405	ERD25FJ222
R 406	ERD25FJ561
R 407	ERD25FJ472
R 408	ERD25FJ562
R 409, 410	ERD25FJ103
R 411	ERD25FJ102
R 412	ERD25FJ222
R 413 ⚠	ERQ12AJ4R7
R 414	ERD25TJ823
R 415	ERD25FJ103
R 416	ERD25FJ391
R 417	ERQ12HJ8R2
R 418 ⚠	ERQ12HJ2R2
R 419 ⚠	ERD50FJ221
R 421	ERG2ANJ100
R 422	ERD25FJ122
R 423	ERD25FJ102
R 424	ERD25FJ103
R 425	ERD25TJ333
R 426, 427	ERD50FJ271
R 428	ERQ14AJ470
R 429	ERD25FJ472
R 502, 503, 504, 505	ERD25TJ273
R 506	ERD25FJ331
R 507	ERD25FJ271
R 508	ERD25FJ331
R 509	ERD25FJ271
R 510	ERD25FJ331
R 511	ERD25FJ271
R 512	ERD25TJ104
R 513	ERD25TJ223
R 514	ERD25FJ562
R 515	ERX12ANJR47
R 516	ERD25FJ1R5
R 517, 523	ERD25FJ222
R 524	ERD25FJ102
R 525	ERD25FJ272
R 526	ERD25FJ562
R 527	ERD25FJ471
R 528	ERD25TJ184
R 701, 702	ERD25FJ222
R 703	ERD25FJ821
R 704	ERQ12HJ150
R 705	ERD25TJ273
R 706	ERD25TJ123
R 707	ERD25FJ681
R 708	ERD25FJ470
R 709	ERD25TJ153
R 801, 802	2ERD25FJ682
R 803, 804	ERD25FJ222
R 805, 806	ERD25FJ103
R 807, 808	ERD25TJ183
R 809, 810	ERD25FJ682
R 811, 812	ERD25FJ102
R 815, 816	ERD25TJ683
R 817, 818	ERD25FJ512
R 819, 820	ERD25FJ222
R 821, 822	ERD25TJ823
R 823, 824	ERD25FJ472
R 825, 826	ERD25TJ123
R 827, 828	ERD25FJ473
R 829, 830	ERD25TJ753
R 831, 832	ERD25TJ334
R 833, 834, 835, 836	ERD25TJ394
R 837, 838	ERD25TJ334
R 845, 848, 849, 850	ERD25TJ273
R 851	ERD25FJ271
R 852. 853	ERD25FJ332
R 854	ERD25TJ273
R 855	ERD25TJ104
R 856	ERD25JK473
R 857, 858	ERD25TJ224
VARIABLE RESISTORS	
VR 1, 2	EWJSEAF22A24
VR 3, 4	EVNM4AA00B24
VR 5, 6	EVNM4AA00B14
VR 11, 12	QWKGTA024A54
VR 13, 14	EVNM4AA00B25
VR 201, 202, 203, 204	EVNM0AA00B54
VR 205, 206, 207, 208	EVNM0AA00B14
VR 301	EVNM4AA00B24
VR 302	EVNM4AA00B53
VR 501	EVNM4AA00B14
CAPACITORS	
C 1, 2	ECEA1HS100
C 3, 4	ECEA50ZR47
C 5, 6	ECEA50Z1
C 7, 8	ECFDD103KXY
C 9, 10, 11	ECKD1H103ZF
C 12	ECKD1H223ZF
C 13, 14	ECKD1H391KB
C 15, 16	ECEA16M10R
C 17, 18	ECKD1H223ZF
C 19, 20	ECKD2H121KB
C 21, 22	ECFDD272KVY
C 23, 24	ECEA1AS221
C 25, 26	ECKD1H332KB
C 27, 28	ECEA50Z1
C 29, 30	ECEA1AS470
C 31, 32	ECKD1H392KB
C 33, 34	ECEA50Z1
C 35, 36	ECFDD102KVY
C 37, 38	ECQM1H153JZ
C 39, 40	ECCD1H101k
C 41, 42	ECEA1AS221
C 43, 44	ECQM1H123JZ
C 45, 46	ECQM1H562JZ
C 47, 48	ECKD1H223ZF
C 49, 50	ECEA1AS471
C 51, 52	ECEA50Z1
C 53, 54	ECEA1HS100
C 55, 56	ECEA1EN3R3
C 57, 58	ECQM1H223JZ
C 59, 60	ECQM1H562JZ
C 61, 62	ECQM1H393JZ
C 64	ECEA50ZR47
C 65, 66	ECQM1H683JZ
C 67, 68	ECQM1H562JZ
C 69, 70	ECEA1ES220
C 71, 72	ECCD1H221K
C 73, 74	ECEA1CS221
C 75, 76	ECFDD103KXY
C 77, 78	ECQV05684JZ
C 79, 80	ECEA1CS330
C 81, 82	ECFDD223KXY
C 83	ECEA1HS100
C 84	ECEA1AS101
C 85	ECFDD104KXY
C 86	ECEA1HS100
C 87	ECFDD104KXY
C 88, 89	ECCD1H101k
C 90	ECFDD153KXY
C 91	ECKD1H103ZF
C 92	ECQM1H822JZ
C 93	ECEA1HF100
C 94	ECEA25Z4R7
C 95	ECEA1ES470
C 96	ECEA1HF100
C 97	ECCD1H820K
C 98	ECQV05334JZ
C 99	ECKD1H392KB
C 100	ECEA50ZR22
C 101	ECEA1HS100
C 102	ECEA25Z4R7
C 103, 104	ECQM1H103JZ
C 105, 106	ECKD1H102KB
C 107	ECQP1153JZ
C 108	ECKD1H103ZF
C 109	ECEA25Z4R7
C 110	ECEA50ZR47
C 111, 112, 113, 114	ECKD1H102KB
C 201. 202	ECEA25Z4R7
C 203, 204	ECEA50Z1
C 205, 206, 207, 208	ECQV05104JZ
C 209, 210	ECQV05334JZ
C 211, 212	ECCD1H201J
C 213. 214	ECQM1H103JZ
C 215, 216	ECCD1H101JZ
C 217, 218	ECQM1H103JZ
C 219, 220	ECCD1H101J
C 221, 222, 223, 224	ECEA25Z4R7
C 225, 226, 227, 228	ECQV05104JZ
C 229. 230, 231, 232	ECQM1H332JZ
C 233, 234	ECCD1H331J
C 235. 236	ECQV05104JZ
C 237, 238	ECQM1H103JZ
C 239, 240	ECQM1H102JZ
C 241, 242	ECEA16M10R
C 243, 244	ECEA1HS100
C 245	ECQM1H102JZ
C 247, 248	ECEA1ES470
C 249, 250	ECCD1H151K
C 301	ECQM1H104JZ
C 302	ECFDD223KXY
C 303, 304	ECEA50Z1
C 305, 306	ECEA50ZR47
C 307, 308	ECEA1HS100
C 309	ECEA1ES101
C 310	ECFDD473KXY
C 401	ECQP1103JZ
C 402	ECEA1V102
C 403	ECEA1ES101
C 404	ECKD1H103ZF
C 405	ECEA1ES220
C 406	ECEA50Z2R2
C 407	ECEA1ES101
C 408	ECEA1ES222

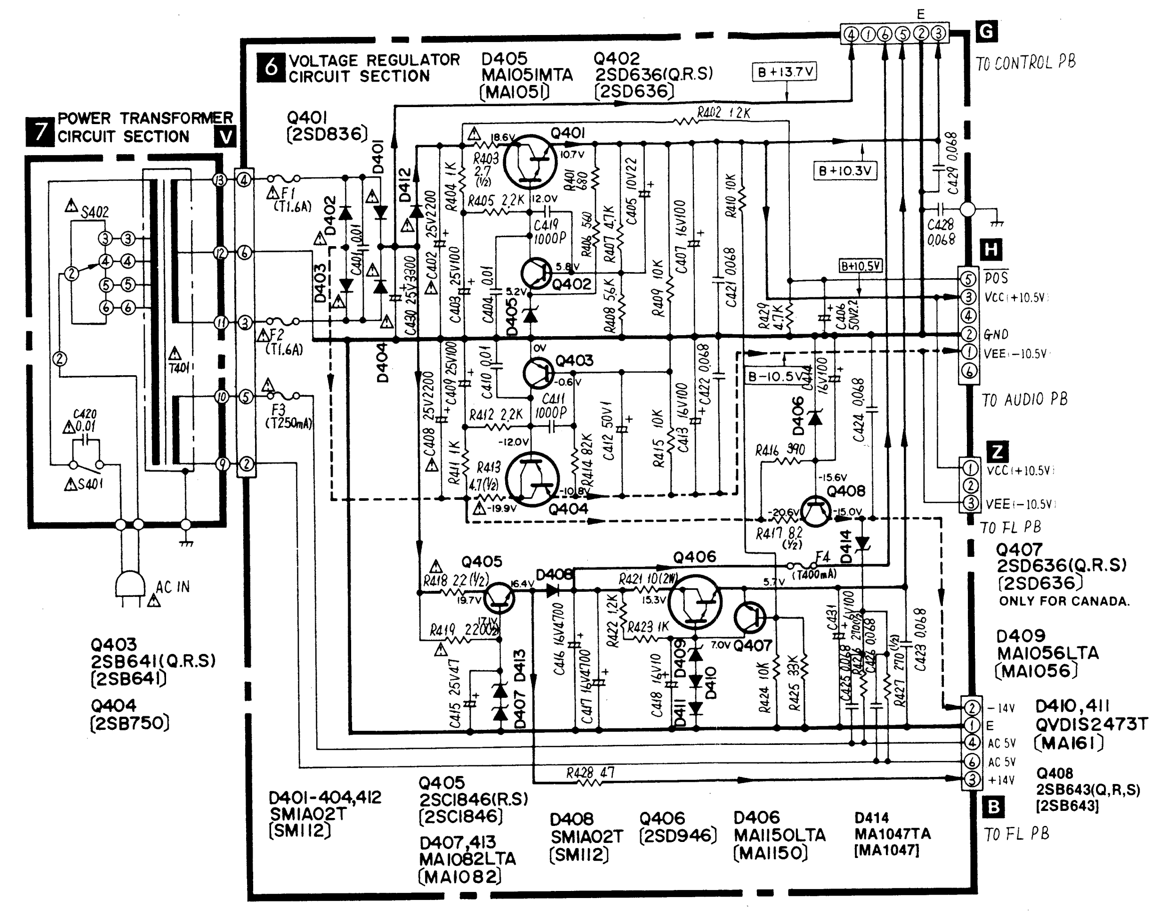
REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

Ref No.	Part No.	Part Name & Description
C 409	ECEA1ES101	
C 410	ECKD1H103ZF	
C 411	ECKD1H102KB	
C 412	ECEA50Z1	
C 413, 414	ECEA1ES101	
C 415	ECEA1ES470	
C 416, 417	ECEA1CS472	
C 418	ECEA1HS100	
C 419	ECKD1H102KB	
C 420	ECQU2A103MF	
C 421, 422, 423, 424, 425, 426, 428, 429	ECFDD683KXY	
C 430	ECEA1ES332	
C 431	ECEA1AS101	
C 502	ECKD1H102MD	
C 503	ECCD1H331KD	
C 504	ECEA1AS221	
C 505	ECKD1H333ZF	
C 506	ECEA50Z2R2	
C 507	ECKD1H222MD	
C 508	ECEA1CN100	
C 511	ECEA50Z1	
C 701	ECKD1H102KB	
C 702	ECKD1H561KB	
C 703	ECKD1H471KB	
C 704	ECEA1ES470	
C 705	ECEA1CN100	
C 801, 802	ECEA50Z1	
C 803, 804	ECEA25Z4R7	
C 807, 808	ECQM1H103JZ	
C 809, 810	ECKD1H681KB	
C 811, 812	ECQM1H683JZ	
C 813, 814	ECQV05154JZ	
C 815, 816	ECQM1H472JZ	
C 817, 818	ECQM1H333JZ	
C 819, 820	ECQM1H472JZ	
C 821, 822	ECQV05104JZ	
C 823, 824, 825, 826	ECEA1HS100	
C 827, 828	ECQM1H473JZ	
C 829, 830	ECQM1H333JZ	
C 831, 832, 833, 834, 835, 836	ECQV05104JZ	
C 837, 838	ECQM1H333JZ	
C 839, 840	ECQV05224JZ	
C 841, 842	ECEA25Z4R7	
C 845	ECEA1HS100	
C 846	ECEA50Z1	
SPARK KILLERS		
Z 301	EXRP682M473T	
Z 501	EXBEQ5273K	
Z 502	EXBD86181K	
Z 503	EXBEQ4272K	
Z 504	QCRFWA1	
Z 505	EXFP4472ZW	
Z 506	EXBD88254K	
Z 507	EXRP152K473T	
TRANSISORS		
Q 1, 2, 3, 4	2SD636	
Q 5	2SB641	
Q 6	2SC945-Q	
Q 7, 8	2SD965	
Q 9, 10, 11	2SD1011	
Q 12	2SA921	
Q 13, 14	2SD965	
Q 15	2SD636	
Q 16	2SB641	
Q 17, 18, 19, 20	2SK104F	
Q 22, 23, 24	2SD636	
Q 25	2SD592	
Q 26	2SD946	
Q 27, 28	2SB641	
Q 29	2SD636	
Q 30, 31	2SC945-Q	
Q 201, 202	2SK104F	
Q 203, 204	2SC945-Q	
Q 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220	2SD1010	
Q 221, 222, 223	2SC945-Q	
Q 225	2SA564R	
Q 227	2SC945-Q	
Q 301, 302	2SD636	
Q 303	2SB641	
Q 401	2SD836	
Q 402	2SD636	
Q 403	2SB641	
Q 404	2SB750	
Q 405	2SC1846R	
Q 406	2SD946	
Q 407	2SD636	
Q 408, 501, 502, 503, 504, 505	2SB643	
Q 506	2SD636	
Q 508	2SD965	
Q 701	2SD1265	
Q 702, 703, 803	2SD636	
Q 804	2SB641	
Q 805	2SD636	
Q 806	2SB641	
DIODES & RECTIFIERS		
D 1, 2, 3, 4	MA161	
D 5	RVDRD7R5FB	
D 7, 8, 9	MA161	
D 12	SM112	
D 13, 14, 15, 16	MA161	
D 17	RVDRD6R2EB	
D 18, 19, 20	MA161	
D 21	SM112	
D 22, 23, 24	MA161	
D 29	TLR208	
D 30	TLG208	
D 31	TLY208	
D 32	TLG208	
D 33, 201, 202, 203. 204, 301, 302, 303, 304, 305, 306	MA161	
D 401, 402, 403, 404	SM112	
D 405	MA1051	
D 406	MA1150	
D 407	MA1082	
D 408	SM112	
D 409	MA1056	
D 410, 411	MA161	
D 412	SM112	
D 413	MA1082	
D 414	MA1047	
D 501, 502, 503, 504, 505; 506, 507, 508, 509, 510, 511, 512, 513, 514	MA161	
D 516	LN31GPHL	
D 517	LN21RPHL	
D 518	LN41YPHL	
D 519	MA161	
D 701	SVDEQA0113RA	
D 702	MA161	
INTEGRATED CIRCUITS		
IC 1, 2	AN6212	
IC 3, 4	AN6213	
IC 5	AN6256	
IC 6	AN6214	
IC 7	BA336	
IC 201, 202	UPC1252H	
IC 203, 204	UPC1253H	
IC 205, 206	NJM4558DF	
IC 301	AN6870N	
IC 302, 303	AN6280	
IC 304	AN6552	
IC 305	BA6138	
IC 501	MN1405RHB	
IC 502	AN6270	
IC 503	DN6838A	
IC 701	M54816P	
IC 801, 802	NE654N	
IC 803, 804	NE652N	
COILS		
L 1, 2	QLQX0343KWA	Bias Trap Coil
L 5	QLQX0332KWA	Peaking Coil
L 6, 7	QLQX0332KWA	Peaking Coil
L 501	ELEH101KA	Choke Coil
L 502,503	QLQZ1014D	Choke Coil
L 801,802	ELM10Q201F	MPX Coil
L 803,804	ELM7Q306A	Skewing Network
TRANSFORMERS		
T 1	QLB0198	Bias Ocsillation Transformer
T 401	QLPD71EMX	AC Power Transformer
FUSES		
F 1, 2	XBAQ0010	Fuse (T 1.6A)
F 3	XBAQ025031	Fuse (T 250mA)
F 4	XBAQ0007	Fuse (T 400mA)
SWITCHES		
S 1	QSR6501	Rotary Switch (NR Selector)
S 401	QSW1117AS	Push Switch (Power ON/OFF)
S 402	QSR1407	Rotary Switch (AC Power Voltage Selector)
S 501	QSW1118	Push Switch (Counter Reset ON/OFF)
S 502	QSW1118	Push Switch (Pause ON/OFF)
S 503	QSW1118	Pusth Switch (Recording)
S 504	QSW1118	Push Switch (STOP)
S 505	QSW1118	Push Switch (Playback)
S 506	QSW1118	Push Switch (Fastfoward)
S 507	QSW1118	Push Switch (Rewind)
S 508	QSW1118	Push Switch (REC MUTE)
S 509	QSW1118	Push Switch (Introduction Search)
S 511,512	QSWY408A	Switch 4 Key Push Switch
S 513	QSWY408A	Switch 4 Key Push Switch
S 514	QSWY408A	Switch 4 Key Push Switch
S 515	QSS1303	Slide Switch (Timer Switch)
S 601	QSB0260	Leaf Switch (Accidental Erase Prevention)
S 602	QSB0260	Leaf Switch (Mode)
S 603	QSB0261	Leaf Switch (Playback)
S 604	QSB0260	Leaf Switch (Stop)
S 605	QSB0261	Leaf Switch (Cassette Detection)
S 606	QSB0266	Leaf Switch (Auto Tape Selector)
S 607	QSB0266	Leaf Switch (Auto Tape Selector)
JACKS		
J 1, 2	QJA0262	Microphone Jack
J 3	QJA0259	Headphone Jack
J 4, 5, 6, 7	QEJ5003S	Jack Board Assembly (LINE IN/OUT)

SCHEMATIC DIAGRAMS


5 dbx CIRCUIT SECTION
Q205 2SD1010 (R, S, T) [2SD1010]
IC205 [NJM4558DF]
Q203 2SC945P [2SC945-Q]
Q207, 209, 213 2SD1010 (R, S, T) [2SD1010]
Q221 2SC945P [2SC945-Q]
Q211,215 2SD1010 (R, S, T) [2SD1010]
D203, 204 QVD1S2473T [MA161]
IC201 [UPC1252H2]
Q227 2SC945P [2SC945-Q]
Q225 2SA564 (R, S, T) [2SA564R]
IC203 [UPC1252H2]
IC205 [NJM4558DF]
Q217, 219 2SD1010 (R, S, T) [2SD1010]
Q223 2SC945P [2SC945-Q]
D201 QVD1S2473T [MA161]
Q201 [2SK104F]
Q205 2SD1010(R,S) [2SD1010R]
B+ 10.5V
B- 10.5V
VCA
RMS Det
TO MAIN CIRCUIT BOARD
disc (H)
Lch in
Encode (H)
Decode (H)
Lch Out
Earth
+Vcc
-Vcc
MAIN CIRCUIT BOARD
Rch Out
MAIN CIRCUIT BOARD
Rch in
D202 QVD1S2473T [MA161]
Q206 2SD1010 (R, S, T) [2SD1010]
IC206 [NJM4558DF]
Q202 [2SK104F]
Q204 2SC945P [2SC945-Q]
Q208, 210, 214 2SD1010R (R, S, T) [2SD1010]
Q212, 216 2SD1010 (R, S, T) [2SD1010]
Q222 2SC945P [2SC945-Q]
IC204 [UPC1253H2]
IC202 [UPC1252H2]
IC206 [NJM4558DF]
Q218, 220 2SD1010 (R, S, T) [2SD1010]


6 VOLTAGE REGULATOR CIRCUIT SECTION
D405 MA105IMTA [MA105I]
Q402 2SD636(Q.R.S) [2SD636]
7 POWER TRANSFORMER CIRCUIT SECTION
Q401 [2SD836]
B+13.7V
B+10.3V
B+10.5V
B-10.5V
TO CONTROL PB
POS
VCC(+10.5V)
GND
VEE(-10.5V)
TO AUDIO PB
TO FL PB
AC IN
S401
S402
T401
F1 (T1.6A)
F2 (T1.6A)
F3 (T250mA)
Q403 2SB641(Q.R.S) [2SB641]
Q404 [2SB750]
D401-404,412 SMIA02T [SMI12]
Q405 2SC1846(R.S) [2SC1846]
D407,413 MA1082LTA [MA1082]
D408 SMIA02T [SMI12]
Q406 [2SD946]
D406 MA1150LTA [MA1150]
D414 MA1047TA [MA1047]
Q407 2SD636(Q.R.S) [2SD636] ONLY FOR CANADA.
D409 MA1056LTA [MA1056]
D410,411 QVD1S2473T [MA161]
Q408 2SB643(Q,R,S) [2SB643]

NOTES:

- S401 . . . . AC power switch
- S402 . . . . AC power voltage select switch.
- VR201, 202 . . . . VCA symmetry adjustment VR
- VR203, 204 . . . . RMS detector adjustment VR
- VR205, 206 . . . . dbx standard level adjustment VR (Encode)
- VR207, 208 . . . . dbx standard level adjustment VR (Decode)
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. 1K = 1,000 (Ω), 1M = 1,000 k(Ω).
- Capacity are in micro-farads (μF) unless specified otherwise.
- The mark (▼) shows test point. e.g. ▽ = Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  - Voltage values shown in dbx section.
    No mark . . . . . . Voltage values at dbx Tape and playback mode.
    (   ) . . . . Voltage values at dbx Tape and record mode.
  - Voltage values shown in voltage regulator section.
    No mark . . . . . . Voltage values at playback mode.
    (   ) . . . . Voltage values at record mode.

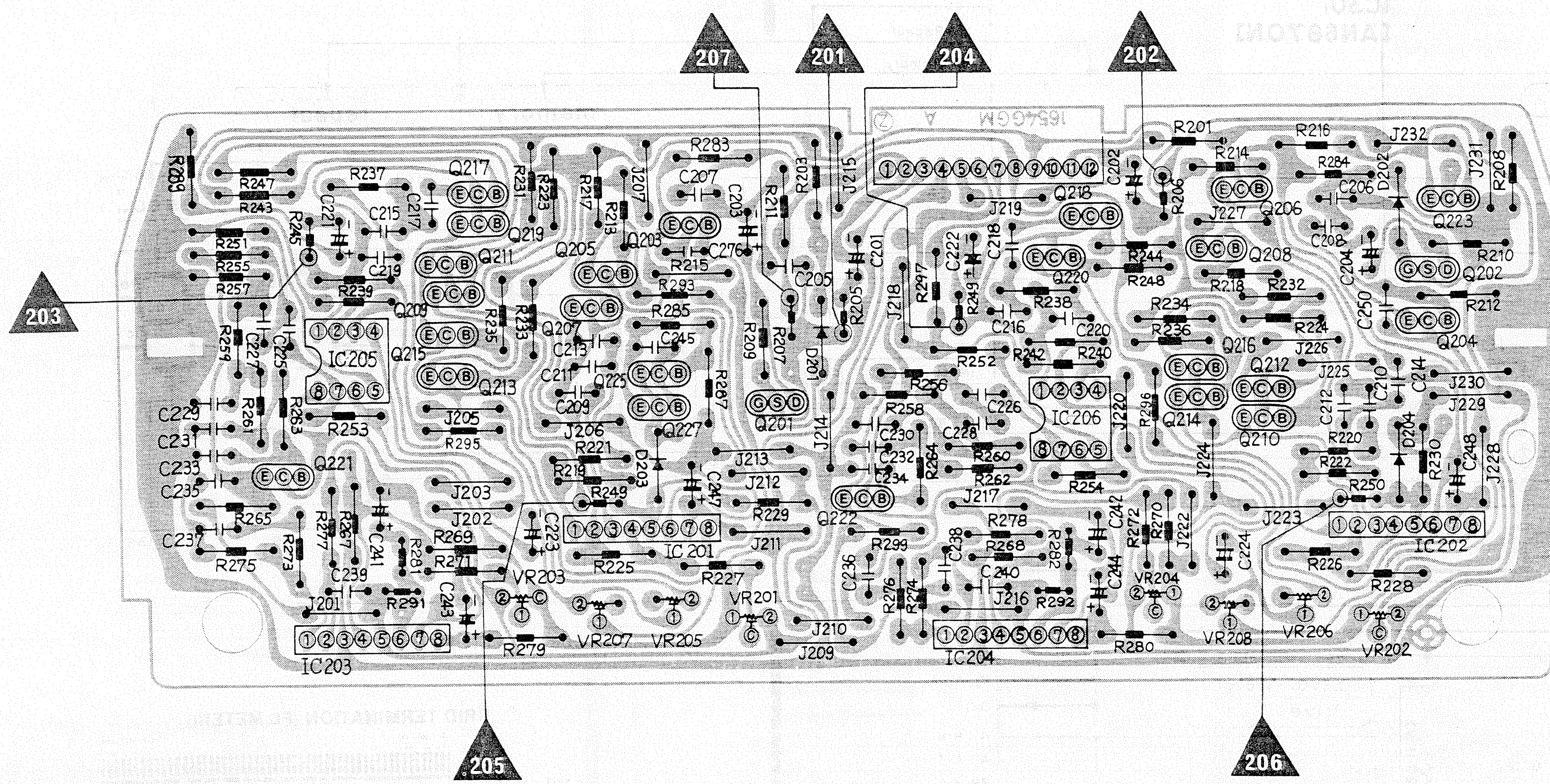
  For measurement use VTVM.
- (■➡■) indicates the flow of the recording signal (dbx tape).
- (━➡━) indicates the flow of the playback signal (dbx tape).

- Important safety notice
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes.
  One type of number is used for supply parts number and production parts number when they are identical.

  e.g. Q1
  2SC1844(E, F) ← Production parts number
  [2SC1844E] ← Supply parts number
  D212
  1S2473T77 ← Production parts number
  [MA161] ← Supply parts numbers
- The supply parts number is described alone in the replacement parts list.
- **This schematic diagram may be modified at any time with the development of new technology.**

CIRCUIT BOARDS

5 dbx CIRCUIT BOARD


207
201
204
202
203
205
206
IC201
IC202
IC203
IC204
IC205
IC206
VR201
VR202
VR203
VR204
VR205
VR206
VR207
VR208

Q201 [2SK104]

G	0V
S	0V
D	−3.26V (3.46V)

Q202 [2SK104]

G	0V
S	0V
D	−3.22V (−2.60V)

Q203 [2SC945-Q]

B	−1.23V
C	9.98V
E	−1.23V

Q204 [2SC945-Q]

B	−1.30V
C	9.98V
E	−1.31V

Q205 [2SD1010]

B	0.01V (−1.23V)
C	−1.23V (−1.23V)
E	−1.43V (−0.66V)

Q206 [2SD1010]

B	0V
C	−1.30V
E	−3.20V (−2.70V)

Q207 [2SD1010]

B	−1.23V (0V)
C	−1.23V
E	−0.66V (−3.36V)

Q208 [2SD1010]

B	−1.31V
C	−1.31V
E	−0.73V

Q209 [2SD1010]

B	0V
C	0V
E	0.01V

Q210 [2SD1010]

B	0V
C	0V
E	0.01V

Q211 [2SD1010]

B	−0.05V (0.04V)
C	0V
E	−0.03V (0.04V)

Q212 [2SD1010]

B	0.02V
C	0V
E	−0.03V

Q213 [2SD1010]

B	0V
C	−0.05V (0.04V)
E	−0.01V (0.01V)

Q214 [2SD1010]

B	0V
C	0.02V (0.04V)
E	−0.01V (0.01V)

Q215 [2SD1010]

B	0.02V
C	0.02V
E	0.03V

Q216 [2SD1010]

B	0.02V
C	0.02V
E	0.03V

Q217 [2SD1010]

B	−0.40V (−0.26V)
C	−0.31V (−0.27V)
E	−1.34V

Q218 [2SD1010]

B	−0.06V (−0.02V)
C	0V
E	−2.30V (−1.29V)

Q219 [2SD1010]

B	0V
C	0V
E	0.56V

Q220 [2SD1010]

B	0V
C	0V
E	0.57V

Q221 [2SC945-Q]

B	−1.44V
C	10.40V
E	−0.81V

Q222 [2SA564R]

B	−1.43V
C	10.40V
E	−0.81V

Q223 [2SC945-Q]

B	−10.20V
C	−2.34V (−2.52V)
E	−10.08V

Q225 [2SA564R]

B	−2.71V
C	−9.71V (−9.62V)
E	−2.85V

Q227 [2SC945-Q]

B	−10.21V
C	−2.71V
E	−9.66V

Q401 [2SD836]

B	12.0V
C	18.6V
E	10.7V

Q402 [2SD636]

B	5.8V
C	12.0V
E	5.2V

Q403 [2SB641]

B	−0.6V
C	−12.0V
E	0V

Q404 [2SB750]

B	−12.0V
C	−19.9V
E	−10.8V

Q405 [2SC1846]

B	17.1V
C	19.7V
E	16.4V

Q406 [2SD946]

B	7.0V
C	15.3V
E	5.7V

Q408 [2SB643]

B	−15.6V
C	−20.6V
E	−15.0V

IC201 [UPC1252H2]

1	0.03V
2	0.01V
3	0.03V
4	0.01V
5	−2.64V
6	0V
7	10.4V
8	−0.06V (0V)

IC202 [UPC1252H2]

1	0.01V
2	0.01V
3	0.03V
4	0V
5	−2.62V (−2.59V)
6	0V
7	10.40V
8	−0.06V (0V)

IC203 [UPC1253H2]

1	0.01V
2	−8.40V
3	0V
4	0.01V
5	−10.20V
6	0.99V
7	0.03V
8	8.73V

IC204 [UPC1253H2]

1	0.01V
2	−8.39V (8.38V)
3	0V
4	0V
5	−10.20V
6	0.99V (1.01V)
7	−0.11V (−0.08V)
8	8.76V

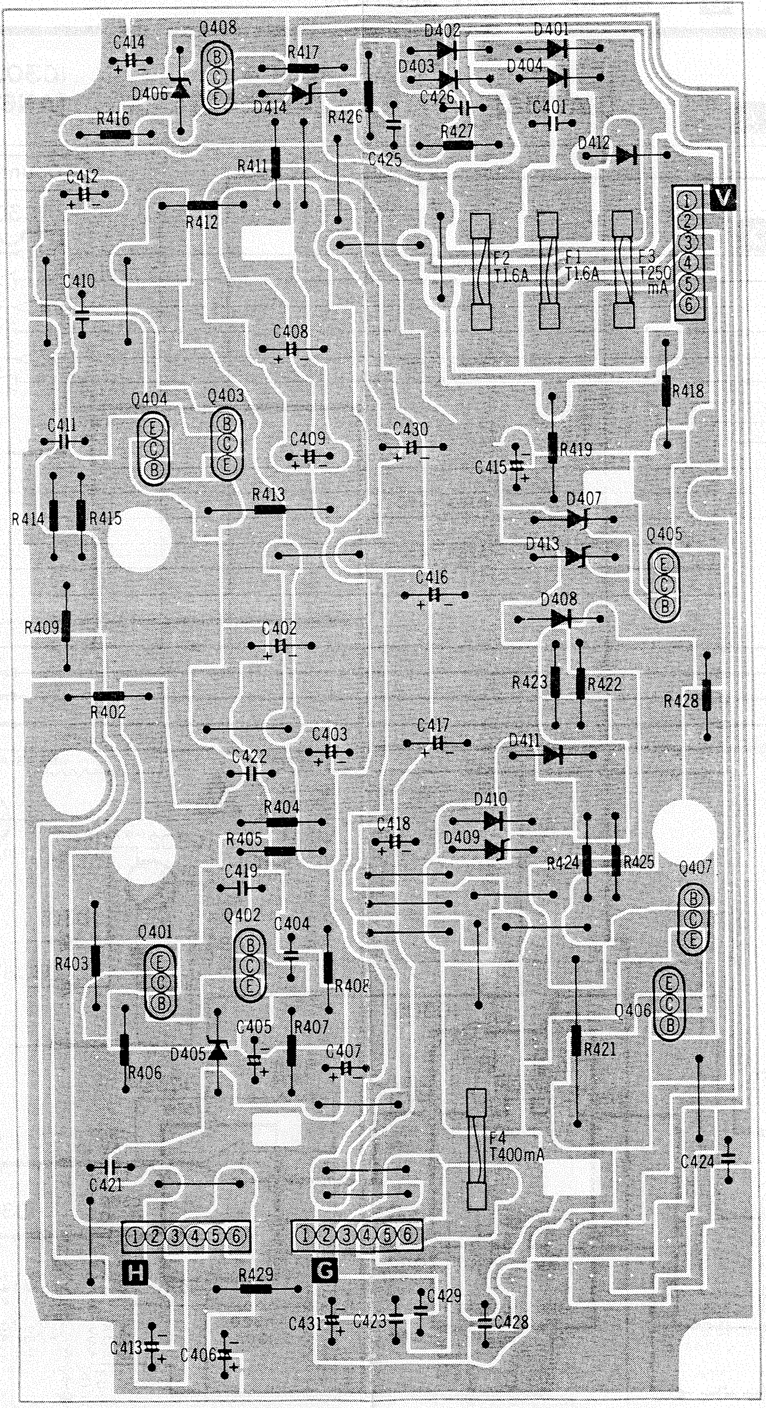
IC205 [NJM4558DF]

1	0V
2	0V
3	0V
4	−10.20V
5	0V
6	0V
7	0V
8	10.40V

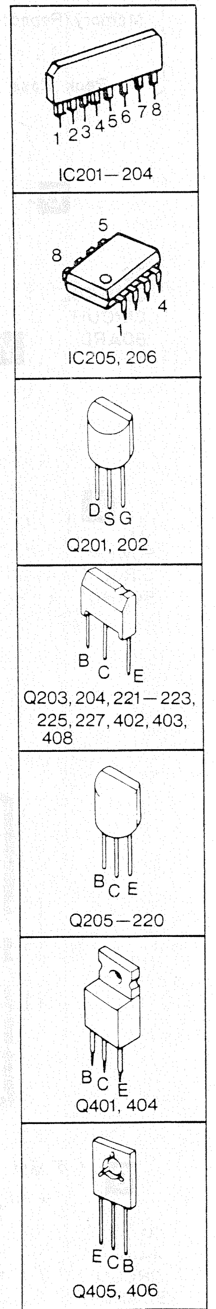
IC206 [NJM4558DF]

1	0V
2	0V
3	0V
4	−10.20V
5	0V
6	0V
7	0V
8	10.40V

6 VOLTAGE REGULATOR CIRCUIT BOARD


V
H
G
F1 T1.6A
F2 T1.6A
F3 T250mA
F4 T400mA
Q401
Q402
Q403
Q404
Q405
Q406
Q407
Q408

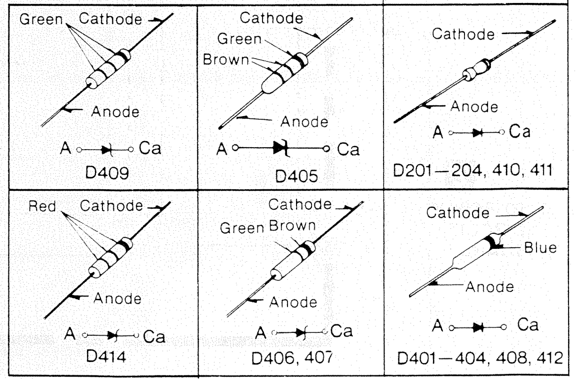
TERMINATIONS


IC201–204
IC205, 206
Q201, 202
Q203, 204, 221–223, 225, 227, 402, 403, 408
Q205–220
Q401, 404
Q405, 406

NOTES:
- The circuit shown in ▨ on the conductor side indicates printed circuit on the back side of the printed circuit board.
- Values indicated in ☐ are under no signal condition and playback mode with volume control at minimum position otherwise specified.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  - Voltage values shown in dbx section.
    No mark ...... Voltage values at dbx Tape and playback mode.
    ( ) .... Voltage values at dbx Tape and record mode.
  - Voltage values shown in voltage regulator section.
    No mark ...... Voltage values at playback mode.
    ( ) .... Voltage values at record mode.

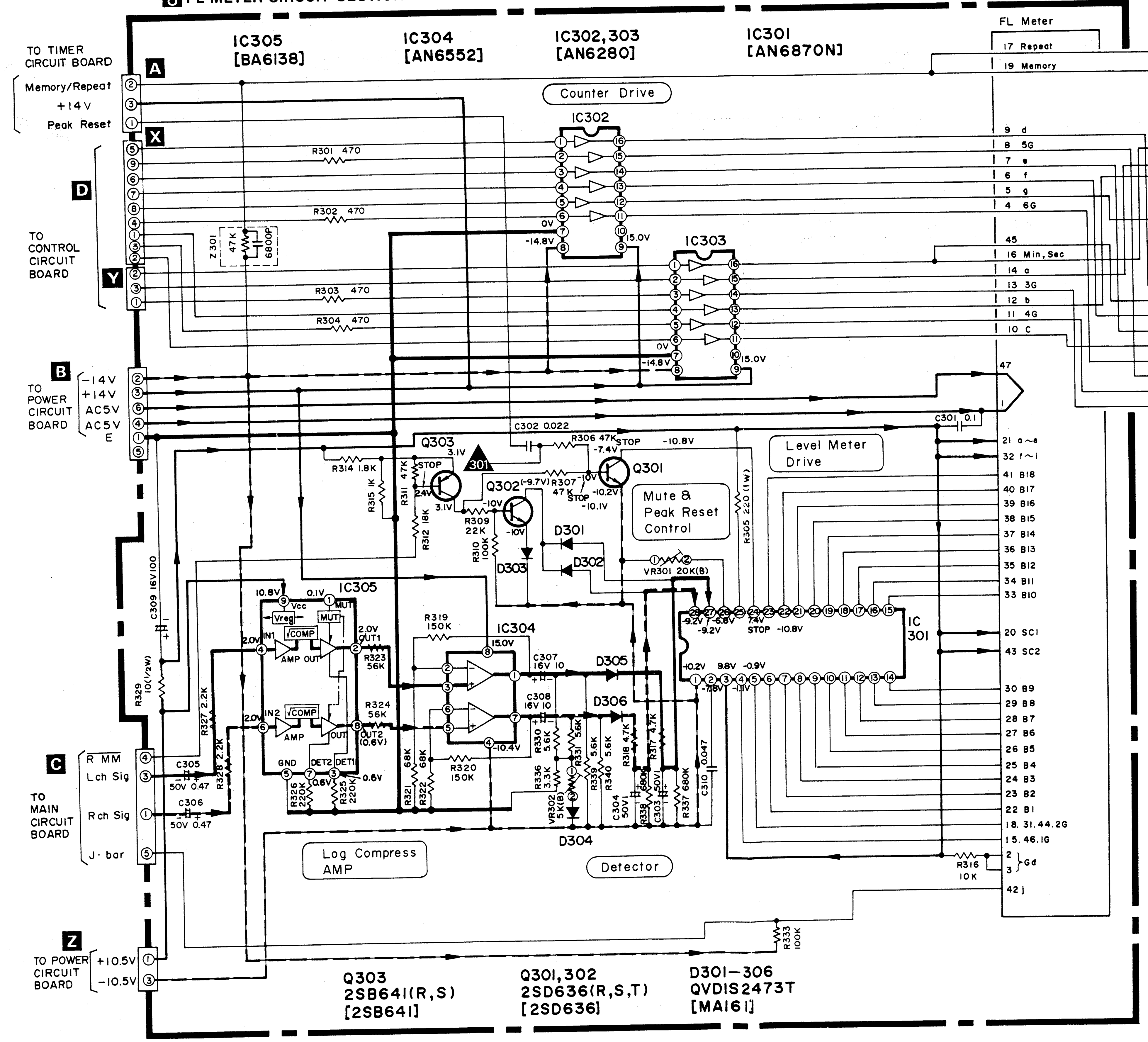
  For measurement use VTVM.

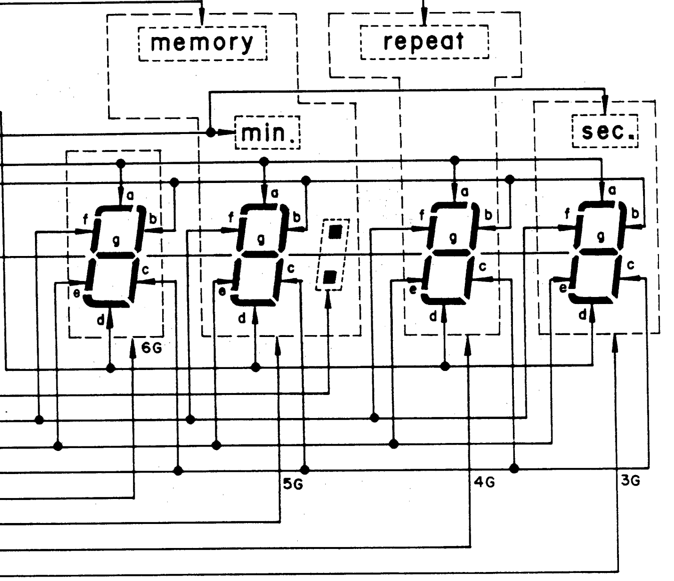
- **This circuit board diagram may be modified at any time with the development of new technology.**


Green
Cathode
Anode
A
Ca
D409
Green
Brown
D405
D201–204, 410, 411
Red
D414
D406, 407
Blue
D401–404, 408, 412

SCHEMATIC DIAGRAM

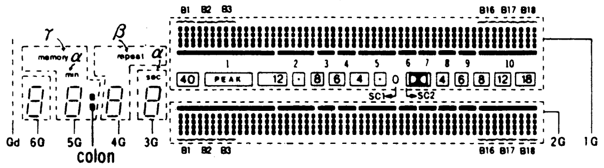
8 FL METER CIRCUIT SECTION


TO TIMER CIRCUIT BOARD
A
Memory/Repeat ②
+14V ③
Peak Reset ①
X
TO CONTROL CIRCUIT BOARD
D
Y
TO POWER CIRCUIT BOARD
B
-14V ②
+14V ③
AC5V ⑥
AC5V ④
E ①
TO MAIN CIRCUIT BOARD
C
R MM ④
Lch Sig ③
Rch Sig ①
J·bar ⑤
TO POWER CIRCUIT BOARD
Z
+10.5V ①
-10.5V ③
IC305 [BA6138]
IC304 [AN6552]
IC302,303 [AN6280]
IC301 [AN6870N]
Counter Drive
IC302
IC303
R301 470
R302 470
R303 470
R304 470
Z301
47K
6800P
0V
-14.8V
15.0V
Level Meter Drive
Mute & Peak Reset Control
Log Compress AMP
Detector
Q303
Q301
Q302
301
C302 0.022
R306 47K
STOP
-10.8V
-7.4V
3.1V
-9.7V
R307 47K
-10.2V
-10.1V
-10V
R314 1.8K
R315 1K
R311 47K
R312 18K
R309 22K
R310 100K
D301
D302
D303
D304
D305
D306
VR301 20K(B)
R305 220 (1W)
C301 0.1
C309 16V100
R329 10(1/2W)
R327 2.2K
R328 2.2K
C305 50V 0.47
C306 50V 0.47
IC305
10.8V
0.1V
Vcc
Vreg
MUT
√COMP
IN1
AMP
OUT
2.0V
OUT1
IN2
OUT2
(0.6V)
GND
DET2
DET1
0.6V
R323 56K
R324 56K
R326 220K
R325 220K
R319 150K
IC304
15.0V
R321 68K
R322 68K
R320 150K
-10.4V
C307 16V 10
C308 16V 10
R330 5.6K
R336 3.3K
R331 5.6K
VR302 5K(B)
R339 5.6K
R340 5.6K
C304 50V1
R318 4.7K
R317 4.7K
R338 680K
C303 50V1
R337 680K
C310 0.047
IC 301
-9.2V
-6.8V
7.4V
STOP
-10.8V
-10.2V
9.8V
-0.9V
-7.8V
-1.1V
R316 10K
R333 100K
FL Meter
17 Repeat
19 Memory
9 d
8 5G
7 e
6 f
5 g
4 6G
45
16 Min, Sec
14 a
13 3G
12 b
11 4G
10 c
47
1
21 a~e
32 f~i
41 B18
40 B17
39 B16
38 B15
37 B14
36 B13
35 B12
34 B11
33 B10
20 SC1
43 SC2
30 B9
29 B8
28 B7
27 B6
26 B5
25 B4
24 B3
23 B2
22 B1
18. 31. 44. 2G
15. 46. 1G
2
3 Gd
42 j
Q303 2SB641(R,S) [2SB641]
Q301,302 2SD636(R,S,T) [2SD636]
D301—306 QVDIS2473T [MA161]

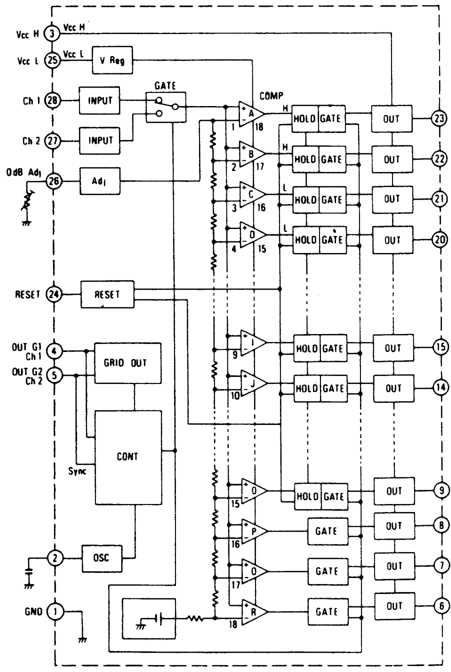

memory
repeat
min.
sec.
a
b
c
d
e
f
g
6G
5G
4G
3G

Digital Multi Counter (FL Meter)

GRID TERMINATION (FL METER)

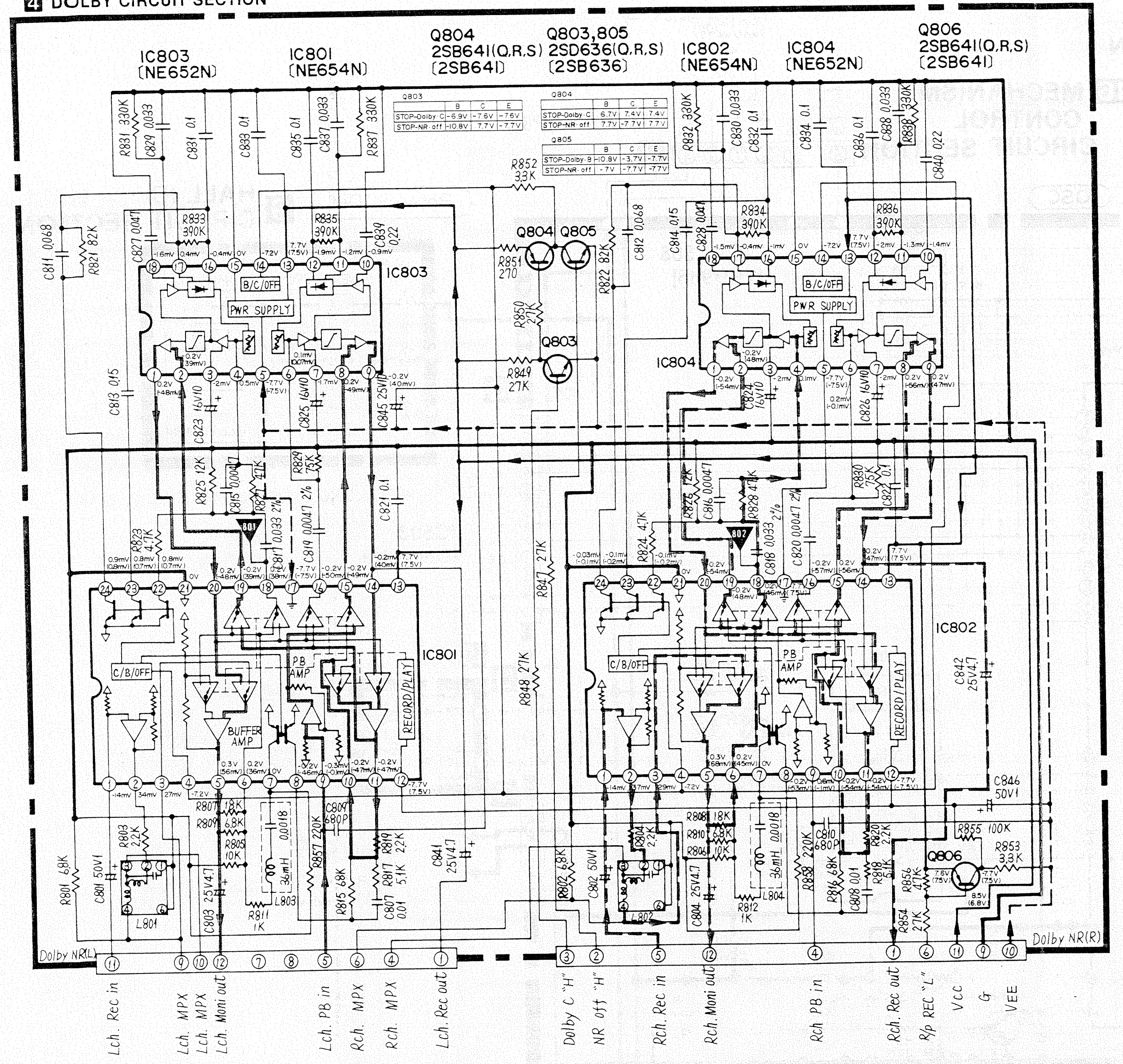

γ
β
memory
α
min
repeat
α
sec
B1 B2 B3
B16 B17 B18
1 2 3 4 5 6 7 8 9 10
40
PEAK
12
8
6
4
0
4
6
8
12
18
SC1
SC2
Gd
6G
5G
colon
4G
3G
2G
1G

EQUIVALENT CIRCUIT
IC301 AN6870N


Vcc H ③
Vcc H
Vcc L ㉕
Vcc L
V Reg
Ch 1 ㉘
Ch 2 ㉗
INPUT
INPUT
GATE
COMP
0dB Adj ㉖
Adj
A
B
C
D
H
H
L
L
HOLD
GATE
OUT
㉓ OUT A (+18dB)
㉒ OUT B (+12dB)
㉑ OUT C (+8dB)
⑳ OUT D (+6dB)
RESET ㉔
RESET
OUT G1 Ch1 ④
OUT G2 Ch2 ⑤
GRID OUT
CONT
Sync
②
OSC
GND ①
I
J
O
P
Q
R
⑮ OUT I (-4dB)
⑭ OUT J (-6dB)
⑨ OUT O (-20dB)
⑧ OUT P (-24dB)
⑦ OUT Q (-30dB)
⑥ OUT R (-40dB)
1 2 3 4 9 10 15 16 17 18

SCHEMATIC DIAGRAM

4 DOLBY CIRCUIT SECTION


IC803 [NE652N]
IC801 [NE654N]
Q804 2SB641(Q,R,S) [2SB641]
Q803,805 2SD636(Q,R,S) [2SB636]
IC802 [NE654N]
IC804 [NE652N]
Q806 2SB641(Q,R,S) [2SB641]
B/C/OFF
PWR SUPPLY
IC803
IC804
IC801
IC802
C/B/OFF
PB AMP
BUFFER AMP
RECORD/PLAY
801
802
Dolby NR(L)
Dolby NR(R)
Lch. Rec in
Lch. MPX
Lch. MPX
Lch. Moni out
Lch. PB in
Rch. MPX
Rch. MPX
Lch. Rec out
Dolby C "H"
NR off "H"
Rch. Rec in
Rch. Moni out
Rch PB in
Rch. Rec out
R/p REC "L"
Vcc
G
VEE

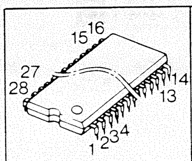
NOTES:

- VR301 . . . . . FL meter adjustment VR (0dB indication)
- VR302 . . . . . FL meter adjustment VR (−40dB indication)
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  1K = 1,000Ω, 1M = 1,000 k(Ω).
- Capacity are in micro-farads (μF) unless specified otherwise.
- The mark (▼) shows test point. e.g. ▼ = Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  ( ) . . . . Voltage values at record mode.
  STOP . . . . . Voltage values at stop mode.
  DOLBY B.....Voltage values at Dolby-B mode.
  DOLBY C.....Voltage values at Dolby-C mode.
  DOLBY B-C..Voltage values at Dolby-B or Dolby-C mode.
  For measurement use VTVM.
- (➡) indicates B + (bias).
- (➡) indicates B − (bias).
- (➡) indicates the flow of the recording signal (dbx tape).
- (➡) indicates the flow of the playback signal (dbx tape).
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes.
  One type of number is used for supply parts number and production parts number when they are identical.

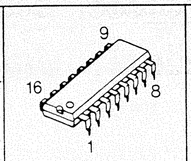
e.g. Q1
2SC1844(E, F)◄— Production parts number
[2SC1844E]◄— Supply parts number
D212
1S2473T77◄— Production parts number
[MA161]◄— Supply parts numbers

- The supply parts number is described alone in the replacement parts list.

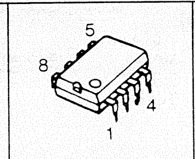
- **This schematic diagram may be modified at any time with the development of new technology.**


15
16
27
28
14
13
1
2
3
4

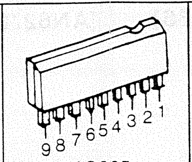
IC301



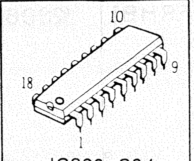
IC302, 303



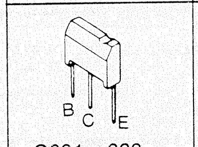
IC304



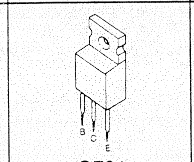
IC305



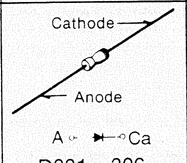
IC803, 804



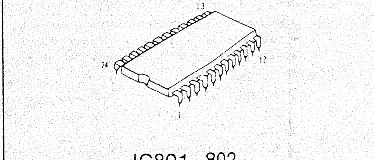
Q301—303, 803—806



Q701


Cathode
Anode
A
Ca

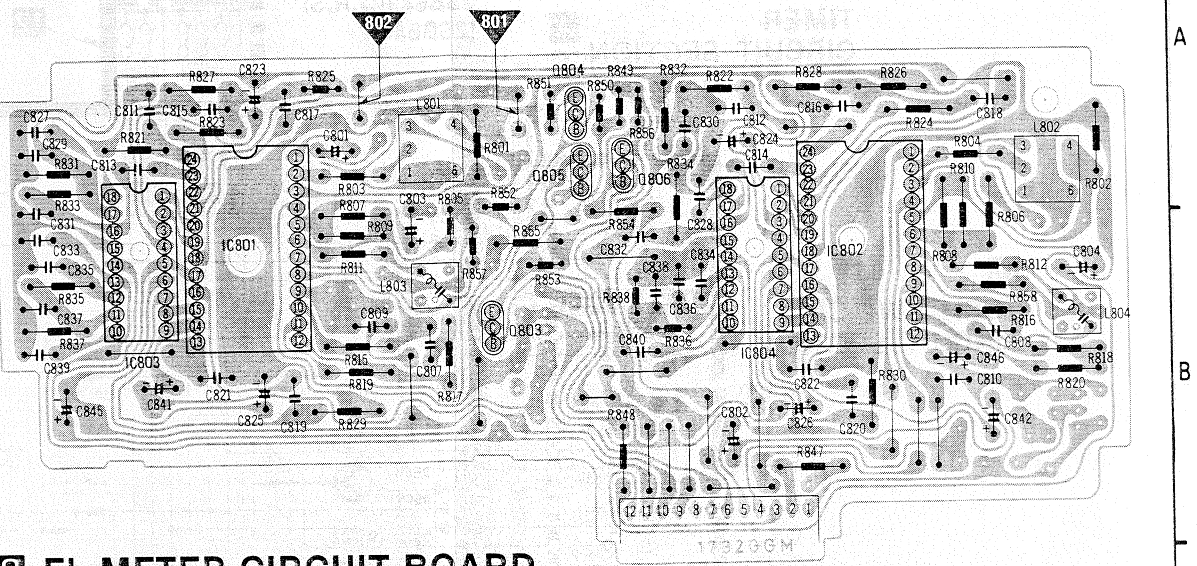
D301—306



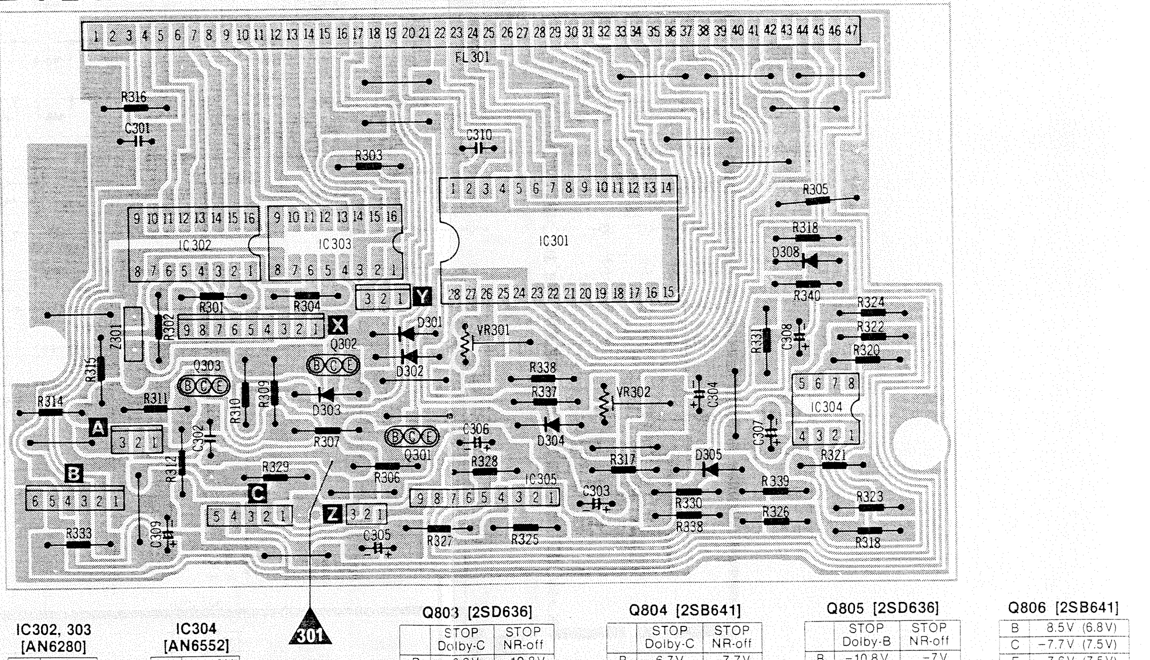
IC801, 802

CIRCUIT BOARDS

4 DOLBY CIRCUIT BOARD


802
801
IC801
IC802
IC803
IC804
Q803
Q804
Q805
Q806
L801
L802
L803
L804
12 11 10 9 8 7 6 5 4 3 2 1
1732GGM

8 FL METER CIRCUIT BOARD


FL301
IC301
IC302
IC303
IC304
IC305
Q301
Q302
Q303
Q308
VR301
VR302
A
B
C
X
Y
Z
301

IC301
[AN6870N]

1	−10.8V	
2	−8.3V	
3	10.3V	
4	−1.0V	
5	−0.9V	
24	−7.4V	STOP −10.8V
25	5.3V	
26	−6.8V	
27	−9.7V	
28	−9.7V	

IC302, 303
[AN6280]

7	0V
8	−14.8V
9	15.0V
10	0V

IC304
[AN6552]

1	0V
2	0V
3	0V
4	−10.8V
5	0V
6	0V
7	0V
8	15.0V

IC801
[NE654N]

1	−14mV	
2	34mV	
3	27mV	
4	−7.2V	
5	0.3V	(56mV)
6	0.2mV	(36mV)
7	0V	
8	−0.2V	(−46mV)
9	−0.3V	(−0.1mV)
10	−0.2V	(−47mV)
11	−0.2V	(−47mV)
12	−7.7V	(7.5V)
13	7.7V	(7.5V)
14	−0.2mV	(40mV)
15	0.2V	(−49mV)
16	−0.2V	(−50mV)
17	−7.7V	(−7.5V)
18	0.2V	(38mV)
19	−0.2V	(39mV)
20	0.2V	(−48mV)
21	0V	
22	0.8mV	(0.7mV)
23	0.8mV	(0.7mV)
24	0.9mV	(0.8mV)

IC802
[NE654N]

1	−14mV	
2	37mV	
3	29mV	
4	−7.2V	
5	0.3V	(68mV)
6	0.2V	(45mV
7	0V	
8	−0.2V	(−53mV)
9	0.6mV	(−1mV)
10	−0.2V	(−54mV)
11	−0.2V	(−54mV)
12	−7.7V	(−7.5V)
13	7.7V	(7.5V)
14	0.2V	(47mV)
15	0.2V	(−56mV)
16	−0.2V	(−57mV)
17	−7.7V	(−7.5V)
18	0.2V	(46mV)
19	−0.9V	(48mV)
20	−0.2V	(−54mV)
21	0V	
22	−0.1mV	(−0.2mV)
23	0.1mV	(−0.2mV)
24	−0.03mV	(−0.1mV)

Q803 [2SD636]

	STOP Dolby-C	STOP NR-off
B	−6.9V	−10.8V
C	−7.6V	7.7V
E	−7.6V	−7.7V

IC305
[BA6138]

1	0.1V	
2	0V	
3	0.6V	
4	2.0V	
5	0V	
6	2.0V	
7	0.6V	
8	0V	(0.6V)
9	10.8V	

IC803, 804
[NE652N]

1	0.2V	(−48mV)
2	−0.2V	(39mV)
3	−2mV	
4	0.5mV	
5	−7.7V	(−7.5V)
6	0.1mV	(0.07mV)
7	−1.7mV	
8	0.2V	(−49mV)
9	−0.2V	(40mV)
10	−0.9mV	
11	−1.2mV	
12	−1.9mV	
13	7.7V	(7.5V)
14	−7.2V	
15	0V	
16	−0.4mV	
17	0.4mV	
18	−1.6mV	

Q804 [2SB641]

	STOP Dolby-C	STOP NR-off
B	6.7V	7.7V
C	7.4V	−7.7V
E	7.4V	7.7V

Q805 [2SD636]

	STOP Dolby-B	STOP NR-off
B	−10.8V	−7V
C	−3.7V	−7.7V
E	−7.7V	−7.7V

Q806 [2SB641]

B	8.5V (6.8V)
C	−7.7V (7.5V)
E	7.6V (7.5V)

Q301
[2SD636]

B	−10.8V	STOP −10.1V
C	−7.4V	STOP −10.8V
E	−10.8V	

Q302
[2SD636]

B	−10.8V	STOP −10.1V
C	−9.7V	STOP −10.3V
E	−10.8V	STOP −10.3V

Q303
[2SB641]

B	—	STOP 2.4V
C	3.1V	
E	3.1V	

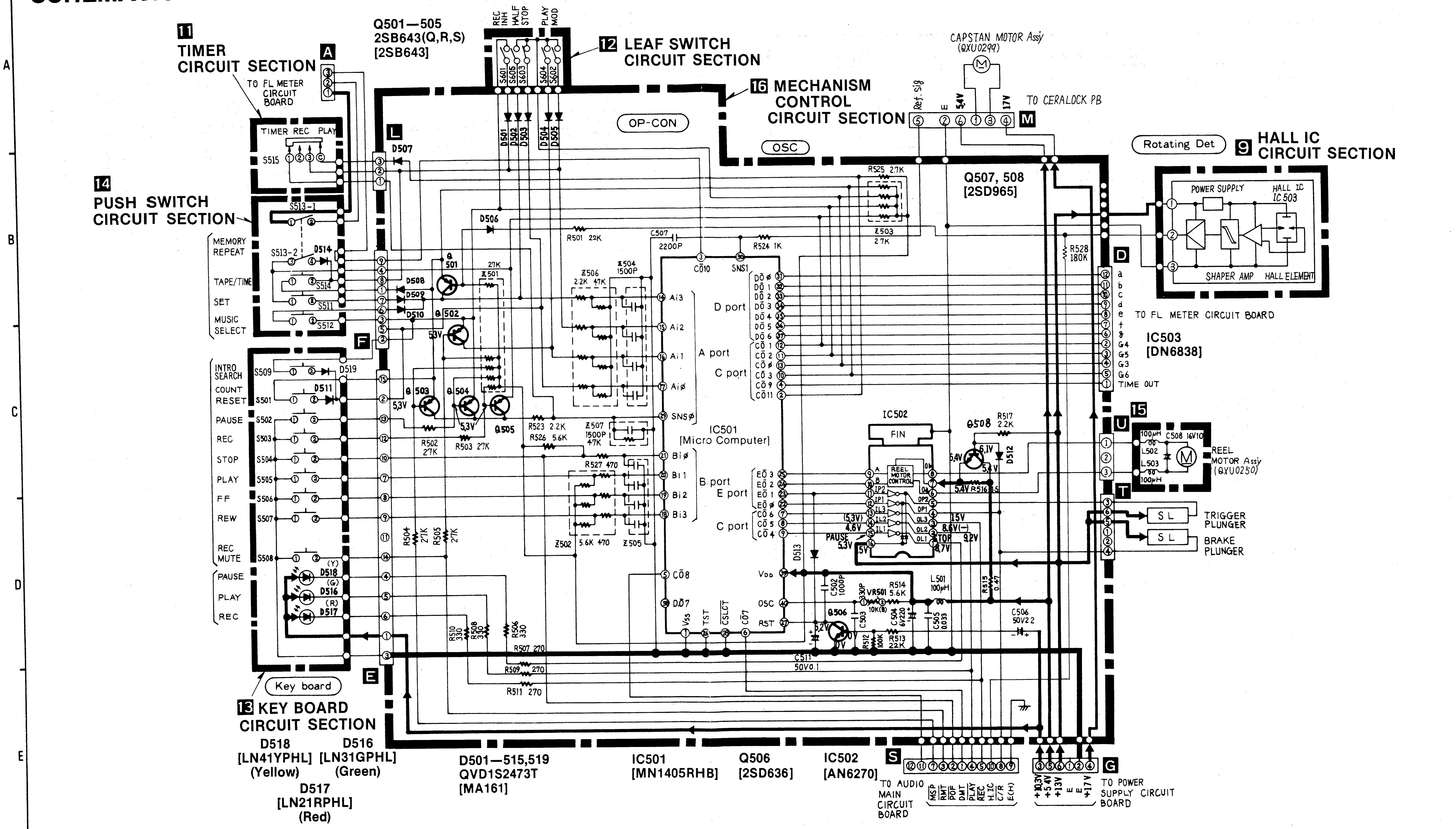
NOTES:

- The circuit shown in ▨ on the conductor side indicates printed circuit on the back side of the printed circuit board.
- Values indicated in ☐ are under no signal condition and playback mode with volume control at minimum position otherwise specified.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  ( ) . . . . Voltage values at record mode.
  STOP . . . . . Voltage values at stop mode.
  DOLBY B.....Voltage values at Dolby-B mode.
  DOLBY C.....Voltage values at Dolby-C mode.
  DOLBY B-C..Voltage values at Dolby-B or Dolby-C mode.
  For measurement use VTVM.

- **This circuit board diagram may be modified at any time with the development of new technology.**

SCHEMATIC DIAGRAM

16 MECHANISM CONTROL CIRCUIT SECTION


11 TIMER CIRCUIT SECTION
TO FL METER CIRCUIT BOARD
TIMER REC PLAY
S515
14 PUSH SWITCH CIRCUIT SECTION
MEMORY REPEAT
TAPE/TIME
SET
MUSIC SELECT
S513-1
S513-2
S514
S511
S512
D514
INTRO SEARCH
COUNT RESET
PAUSE
REC
STOP
PLAY
FF
REW
REC MUTE
PAUSE
PLAY
REC
S509
S501
S502
S503
S504
S505
S506
S507
S508
D519
D511
D518 (Y)
D516 (G)
D517 (R)
Key board
13 KEY BOARD CIRCUIT SECTION
D518 [LN41YPHL] (Yellow)
D516 [LN31GPHL] (Green)
D517 [LN21RPHL] (Red)
Q501—505 2SB643(Q,R,S) [2SB643]
REC INH
HALF
STOP
PLAY
MOD
S601 S605 S603 S604 S602
D501 D502 D503 D504 D505
12 LEAF SWITCH CIRCUIT SECTION
16 MECHANISM CONTROL CIRCUIT SECTION
OP-CON
OSC
D507
D506
D508
D509
D510
Q501
Q502
Q503
Q504
Q505
R501 22K
R502 27K
R503 27K
R504 27K
R505 27K
R506 330
R507 270
R508 330
R509 270
R510 330
R511 270
R523 2.2K
R524 1K
R525 27K
R526 5.6K
R527 470
R528 180K
Z501 27K
Z502 5.6K 470
Z503 27K
Z504 1500P
Z505
Z506 2.2K 47K
Z507 1500P 47K
C507 2200P
IC501 [Micro Computer]
D port
A port
C port
B port
E port
Ai3 Ai2 Ai1 Aiø
SNSø
Biø Bi1 Bi2 Bi3
CÕ8 DÕ7 Vss TST CSLCT CÕ7
VDD OSC RST
CÕ10 SNS1
IC502
FIN
REEL MOTOR CONTROL
PAUSE 5.3V
Q506
VR501 10K(B)
R512 100K
R513 22K
R514 5.6K
R515 0.47
R516
R517 2.2K
C502 1000P
C503 330P
C504 6V220
C505 0.033
C506 50V2.2
C511 50V0.1
L501 100μH
D512
D513
Q507, 508 [2SD965]
Q508
CAPSTAN MOTOR Assy (QXU0299)
Ref. Sig
E
5.4V
E
17V
TO CERALOCK PB
M
Rotating Det
9 HALL IC CIRCUIT SECTION
POWER SUPPLY
HALL IC IC503
SHAPER AMP
HALL ELEMENT
a b c d e f g G4 G5 G3 G6 TIME OUT
TO FL METER CIRCUIT BOARD
IC503 [DN6838]
15
U
C508 16V10
L502
L503
100μH
REEL MOTOR Assy (QXU0250)
T
SL
TRIGGER PLUNGER
SL
BRAKE PLUNGER
A B C D E F G L S
D501—515,519 QVD1S2473T [MA161]
IC501 [MN1405RHB]
Q506 [2SD636]
IC502 [AN6270]
TO AUDIO MAIN CIRCUIT BOARD
MSP RMT POF DMT PLAY REC H.IC C/R E(H)
+10.3V +5.4V +13V E E +17V
TO POWER SUPPLY CIRCUIT BOARD

NOTES:

- VR501 ..... Input scanning time adjustment VR
- S501 ...... Counter reset switch
- S502 ...... Pause switch
- S503 ...... Record switch
- S504 ...... Stop switch
- S505 ...... Playback switch
- S506 ...... Fast Forward switch
- S507 ...... Rewind switch
- S508 ...... Record mute switch
- S509 ...... Intro search switch.
- S511 ...... Set switch
- S512 ...... Music select switch

- S513 ...... Memory repeat switch
- S514 ...... Tape/Time select switch
- S515 ...... Timer switch
  (shown in REC position; (1) REC, (2) OFF, (3) PLAY)
- S601 ...... Accidental erase prevention switch
- S602 ...... Mode switch
- S603 ...... Stop switch
- S604 ...... Playback switch
- S605 ...... Cassette detection switch

Mode sensing switches

- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  1K = 1,000 (Ω), 1M = 1,000 k(Ω).
- Capacity are in microfarads (μF) unless specified otherwise.

P = Pico-farads.

- The mark (▼) shows test point. e.g. ▽ = Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position.
  However, the voltage in record mode is indicated in (   ) when it differs from that in playback mode.
  For measurement, use VTVM.
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors are diodes.
  One type of number is used for supply parts number and production parts number when they are identical.

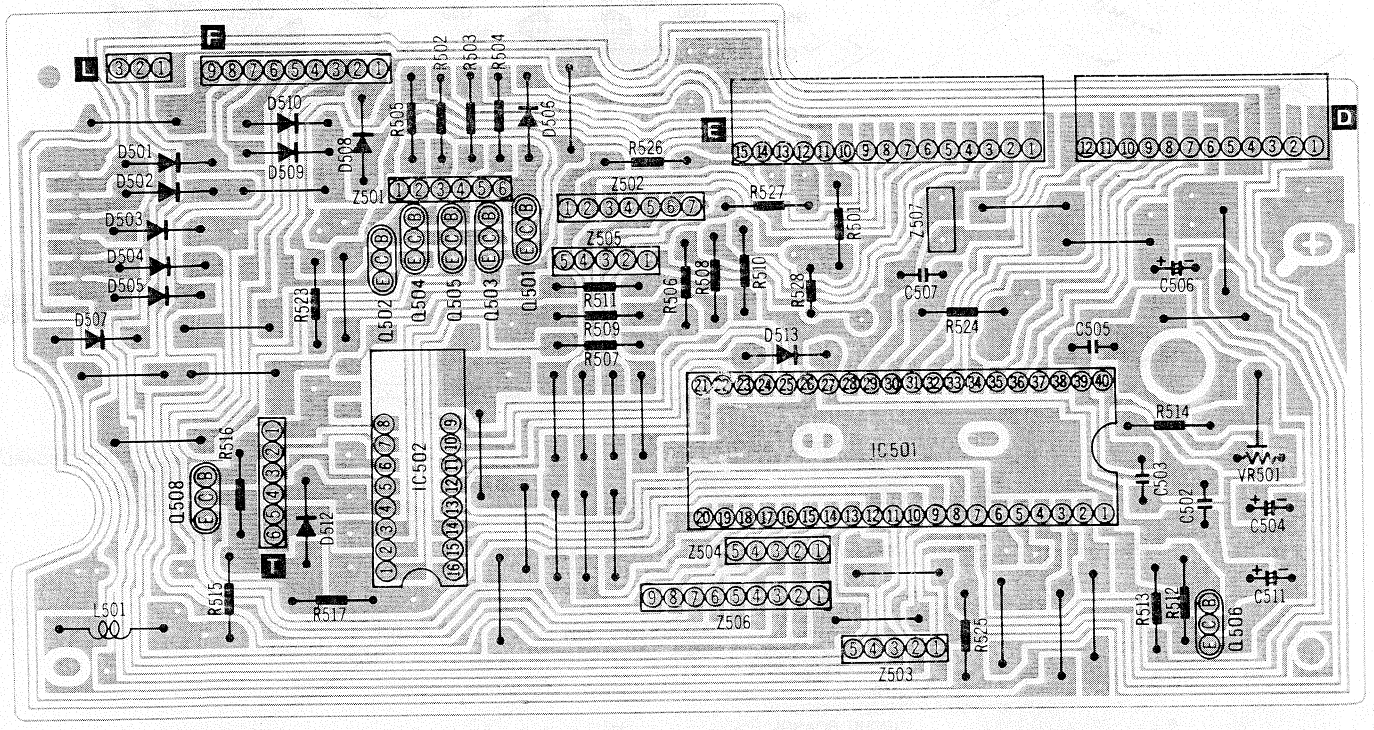
e.g. Q1
2SC1844(E, F)◄— Production parts number
[2SC1844E]◄—— Supply parts number
D301
QVD1S2473T◄—— Production parts number
[MA161]◄——— Supply parts

- The supply parts number is described alone in the replacement parts list.
- **This schematic diagram may be modified at any time with the development of new technology.**

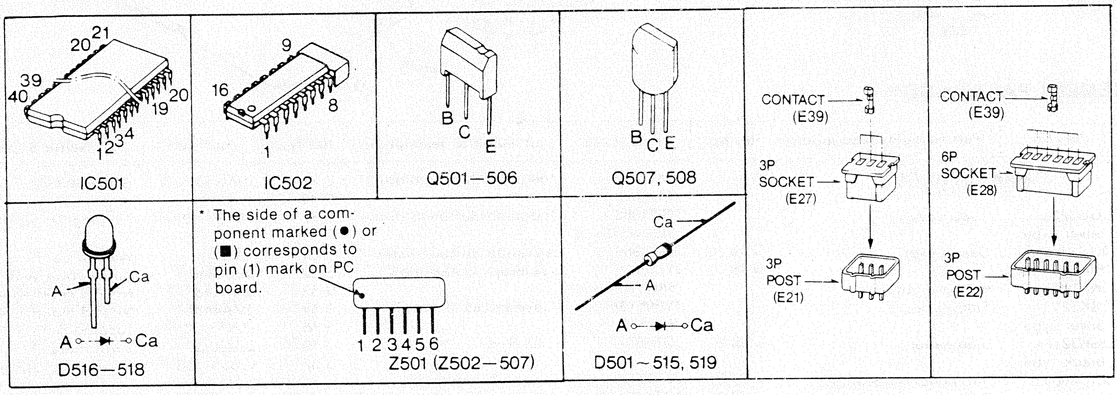
4 3 2 1

CIRCUIT BOARD DIAGRAM

16 MECHANISM CONTROL CIRCUIT BOARD


L
F
E
D
T
3 2 1
9 8 7 6 5 4 3 2 1
15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
12 11 10 9 8 7 6 5 4 3 2 1
D501
D502
D503
D504
D505
D507
D508
D509
D510
D506
D512
D513
R502
R503
R504
R505
R506
R507
R508
R509
R510
R511
R512
R513
R514
R515
R516
R517
R501
R523
R524
R525
R526
R527
R528
Z501
Z502
Z503
Z504
Z505
Z506
Z507
Q501
Q502
Q503
Q504
Q505
Q506
Q508
E C B
IC501
IC502
C502
C503
C504
C505
C506
C507
C511
VR501
L501
A
B
C

TERMINATIONS


21
20
39
40
20
19
1 2 3 4
IC501
9
16
8
1
IC502
B
C
E
Q501—506
B C E
Q507, 508
CONTACT (E39)
3P SOCKET (E27)
3P POST (E21)
CONTACT (E39)
6P SOCKET (E28)
3P POST (E22)
Ca
A
A ○—▶|—○ Ca
D516—518
* The side of a component marked (●) or (■) corresponds to pin (1) mark on PC board.
1 2 3 4 5 6
Z501 (Z502—507)
Ca
A
A ○—▶|—○ Ca
D501 ~ 515, 519
D

NOTES:

- The circuit shown in ▨ on the conductor side indicates printed circuit on the back side of the printed circuit board.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position.
  However, the voltage in record mode is indicated in ( ) when it differs from that in record mode.
  For measurement, use VTVM.

- **This circuit board diagram may be modified at any time with the development of new technology.**

E

IC501
[MN1405RHB]

1	0V		21	5.4V
2	0V		22	0V
3	—		23	0V
4	0V	TIME COUNT 5.3V	24	0V
5	0V	INTRO SEARCH 5.3V	25	0V
6	0V	STOP 5.3V	26	0V
7	0V	(5.3V)	27	5.2V
8	4.6V		28	0V
9	0V	PAUSE 5.3V	29	—
10	—		30	—
11	—		31	—
12	—		32	—
13	—		33	—
14	—		34	—
15	—		35	—
16	—		36	—
17	—		37	—
18	5.4V		38	—
19	5.4V		39	5.4V
20	5.4V		40	—

IC502
[AN6270]

1	9.7V	PAUSE 0V
2	0V	STOP 9.2V
3	9.2V	(0V)
4	15V	FF/REW 0V
5	0V	
6	0V	
7	5.4V	
8	0V	
9	0V	
10	0V	
11	0V	
12	0V	
13	0V	(5.3V)
14	4.6V	
15	0V	PAUSE 5.3V
16	15V	

Q501
[2SB643]

B	—
C	—
E	—

Q502, 503, 504, 505
[2SB643]

B	5.4V
C	—
E	—

Q506
[2SD636]

B	0V
C	5.2V
E	0V

F

Q507
[2SD965]

B	0.6V
C	5.4V
E	0V

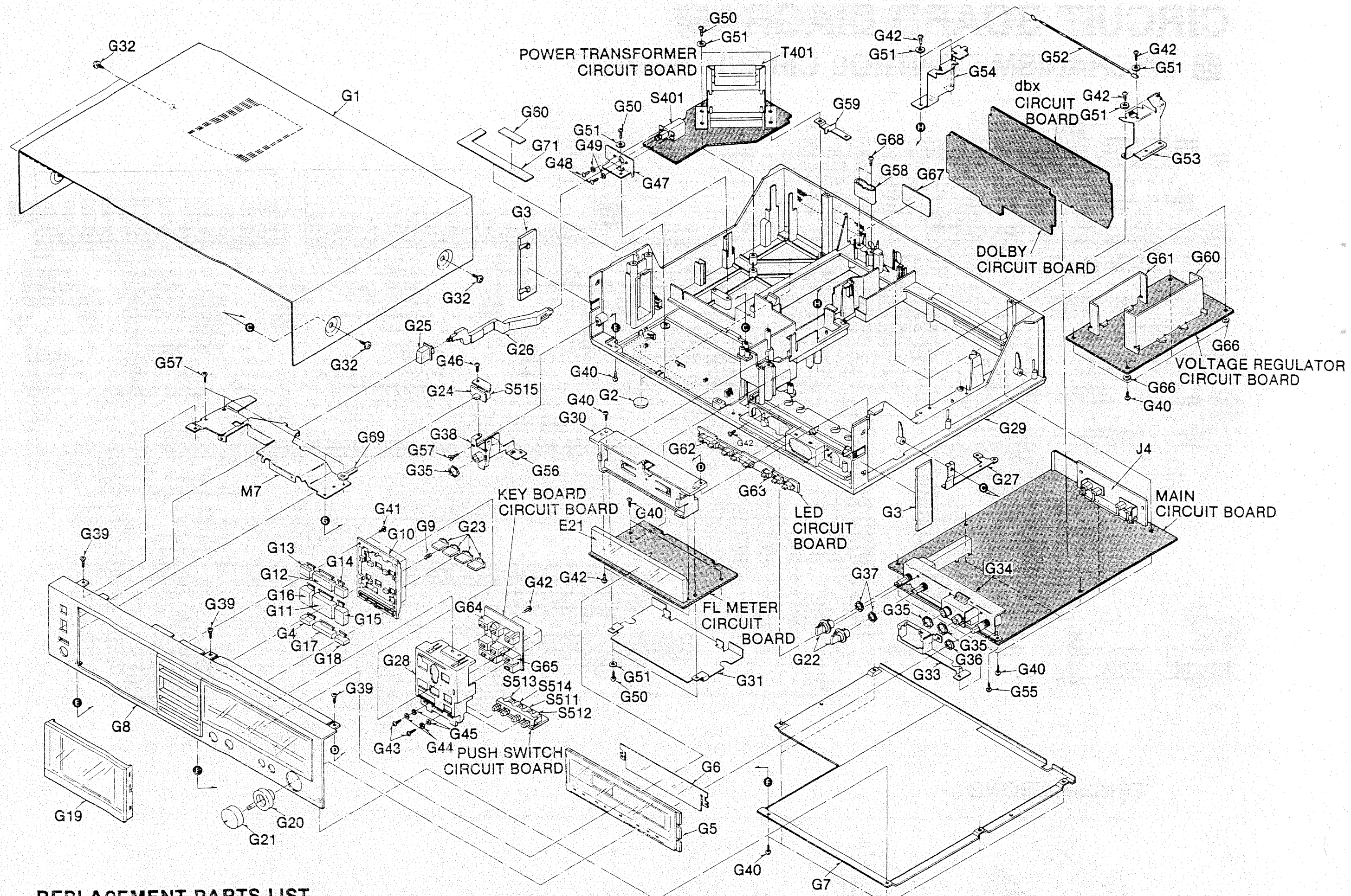
Q508
[2SD965]

B	6.0V
C	5.4V
E	5.4V

IC503
[DN6838A]

1	14.8V
2	0V
3	—

CABINET PARTS LOCATION


G32
G1
G50
G51
POWER TRANSFORMER
CIRCUIT BOARD
T401
G42
G51
G54
G52
G42
G51
dbx
CIRCUIT
BOARD
G42
G51
G53
G60
G50
S401
G59
G51
G49
G71
G48
G47
G68
G58
G67
G3
DOLBY
CIRCUIT BOARD
G61
G60
G66
VOLTAGE REGULATOR
CIRCUIT BOARD
G66
G40
G32
G25
G26
G32
G57
G46
G24
S515
G40
G40
G2
G30
G29
G69
G38
G57
G35
G56
G62
G42
G63
J4
M7
G41
KEY BOARD
CIRCUIT BOARD
E21
G40
LED
CIRCUIT
BOARD
G27
G3
MAIN
CIRCUIT BOARD
G39
G10
G9
G23
G13
G14
G12
G16
G11
G15
G39
G42
G42
G64
G37
G34
FL METER
CIRCUIT
BOARD
G35
G4
G17
G18
G28
G65
S513
S514
S511
S512
G51
G50
G31
G22
G33
G35
G36
G40
G55
G39
G8
G43
G44
G45
PUSH SWITCH
CIRCUIT BOARD
G6
G19
G20
G21
G5
G40
G7

REPLACEMENT PARTS LIST

CABINET PARTS

Ref No.	Part No.	Part Name & Description
G 1	QGC1225 “Silver Type”	Case Cover
	QGC1225K “Black Type”	Case Cover
G 2	QKA1086	Rubber Foot
G 3	QGK3217 “Silver Type”	Side Panel
	QGK3217K “Black Type”	Side Panel
G 4	QGO2050	Intoroduction Search Button
G 5	QGK3295 “Silver Type”	Meter Cover
	QGK3295K “Black Type”	Meter Cover
G 6	QGL1174	Meter Filter
G 7	QYB0416	Bottom Cover Assembly
G 8	QYP1124 “Silver Type”	Front Panel Assembly
	QYP1124K “Black Type”	Front Panel Assembly
G 9	QBC1159	Button Spring
G 10	QGG0194	Button Holder
G 11	QXB0763	Play Button Assembly
G 12	QXB0762	Pause Button Assembly
G 13	QXB0761	REC Button Assembly
G 14	QGO1984 “Silver Type”	Operation Button (REC MUTE)
	QGO1984Y “Black Type”	Operation Button (REC MUTE)
G 15	QGO1981 “Silver Type”	Operation Button (Fast Forward)
	QGO1981Y “Black Type”	Operation Button (Fast Forward)
G 16	QGO1980 “Silver Type”	Operation Button (Rewind)
	QGO1980Y “Black Type”	Operation Button (Rewind)
G 17	QGO1982 “Silver Type”	Operation Button (Stop)
	QGO1982 “Black Type”	Operation Button (Stop)
G 18	QGO1983	Operation Button (Reset)
G 19	QYF0573 “Silver Type”	Cassette Lid Assembly
	QYF0573K “Black Type”	Cassette Lid Assembly
G 20	QGT1571	Knob-B
G 21	QYT0640	Knob-A Assembly
G 22	QGT1569	Knob (for Output Level/NR Selector)
G 23	QGO1985S	Function Button
G 24	QGO1987S	Timer Button
G 25	QGO1986	Push Button (for Power ON/OFF)
G 26	QMR1985	Power Rod
G 27	QJC0047	Earth Plate-A
G 28	QKJ0514	Operation P.B Holder
G 29	QKM1547	Main Case
G 30	QKJ0513	Meter Holder
G 31	QTS1572	Shield Plate (for FL Meter)
G 32	XTB4 + 10BFN “Silver Type”	Tapping Screw ⊕4 × 10
	XTB4 + 10BFZ “Black Type”	Tapping Screw ⊕4 × 10
G 33	QJC0048	Earth Plate-B
G 34	QMA4360	Volume Angle
G 35	QNQ1070	Nut 12ϕ
G 36	QNQ1039	Nut 9ϕ
G 37	QNQ1004	Nut 8ϕ
G 38	QMA4361	Headphones Angle
G 39	XTS3 + 12B	Tapping Screw ⊕3 × 12
G 40	XTV3 + 10BFN	Tapping Screw ⊕3 × 10
G 41	XTN26 + 8B	Tapping Screw ⊕2.6 × 8
G 42	XTN3 + 10B	Tapping Screw ⊕3 × 10
G 43	XSN26 + 8	Screw ⊕2.6 × 8
G 44	XWA26B	Washer 2.6ϕ
G 45	XWG26	Washer 2.6ϕ
G 46	XTN3 + 6B	Tapping Screw ⊕3 × 6
G 47	QMA4362	Switch Angle
G 48	XSN3 + 8S	Screw ⊕3 × 8
G 49	XWA3B	Washer 3ϕ
G 50	XTN3 + 12B	Tapping Screw ⊕3 × 12
G 51	XWG3	Washer 3ϕ
G 52	QBS1140	Connection Wire
G 53	QMA4435	NR P.B Holding Angle-R
G 54	QMA4434	NR P.B Holding Angle-L
G 55	XTN3 + 8B	Tapping Screw ⊕3 × 8
G 56	QJC0052	Earth Plate-C
G 57	XTS3 + 10B	Tapping Screw ⊕3 × 10
G 58	QTD1164	Cord Bushing
G 59	QJC0053	Earth Plate-D
G 60	QTH1162	Heat Sink-A
G 61	QTH1163	Heat Sink-B
G 62	QKJ0515	L.E.D Holder-A
G 63	QKJ0516	L.E.D Holder-B
G 64	QKJ0541	Switch Holder-A
G 65	QKJ0542	Switch Holder-B
G 66	QBK7126	Washer
G 67 [D]	QGS3032	Name Plate
[For all European areas except United Kingdom.]		
[B]	QGS3033	Name Plate
[For United Kingdom.]		
G 68	XTN3 + 16B	Tapping Screw ⊕3 × 16
G 69	QJT0015	Lug Terminal
G 70	QTS1592	Head Shield Sheet
G 71	QTW1277	Shield Plate

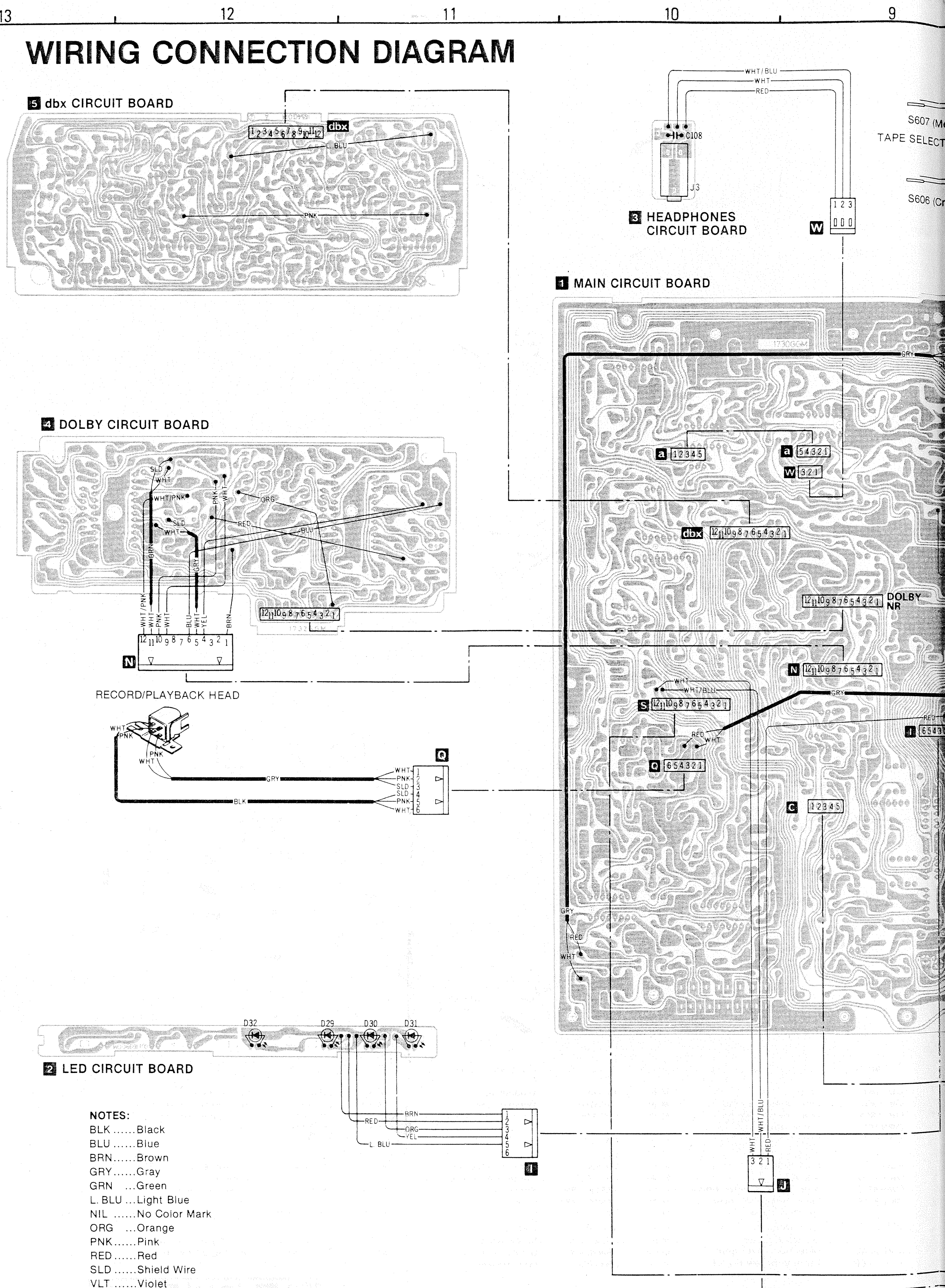
ACCESSORIES

Ref No.	Part No.	Part Name & Description
A 1	QEB0125	Connection Cord
A 2 [D]	QQT3348	Instraction Book
[For all European areas except United Kingdom.]		
[B]	QQT3349	Instraction Book
[For United Kingdom.]		

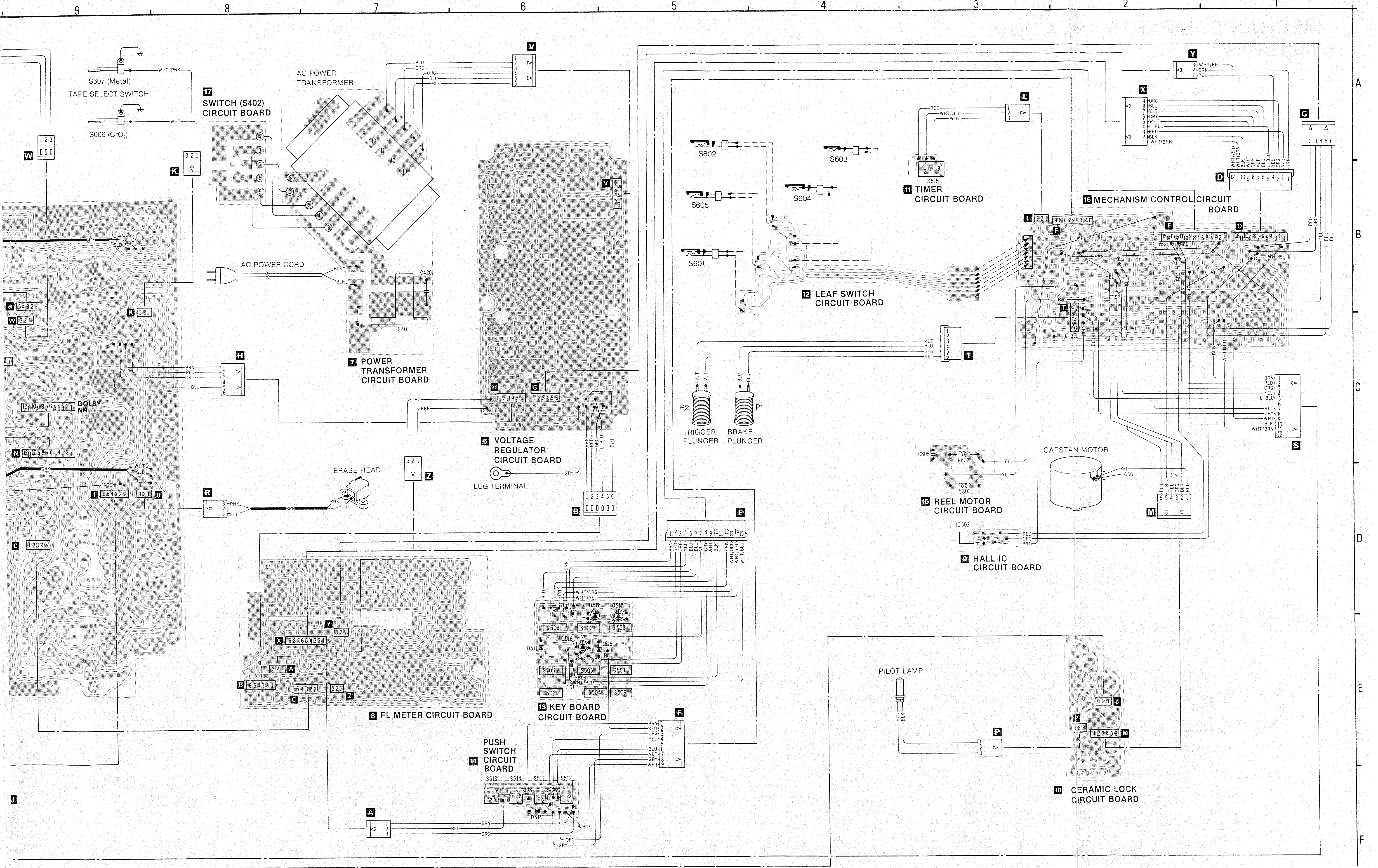
PACKINGS

Ref No.	Part No.	Part Name & Description
P 1	QPN4359	Inside Carton
P 2	QPA0673	Cushion-R
P 3	QPA0674	Cushion-L
P 4	QPA0662	Spacer
P 5	XZB50X65A02	Poly Bag (for UNIT)
P 6	QPC0072	Poly Sheet

WIRING CONNECTION DIAGRAM


13
12
11
10
9
5 dbx CIRCUIT BOARD
1 2 3 4 5 6 7 8 9 10 11 12
dbx
L. BLU
PNK
WHT/BLU
WHT
RED
C108
J3
3 HEADPHONES CIRCUIT BOARD
1 2 3
W
S607 (M
TAPE SELECT
S606 (Cr
1 MAIN CIRCUIT BOARD
GRY
a 1 2 3 4 5
a 5 4 3 2 1
W 3 2 1
dbx 12 11 10 9 8 7 6 5 4 3 2 1
12 11 10 9 8 7 6 5 4 3 2 1 DOLBY NR
N 12 11 10 9 8 7 6 5 4 3 2 1
WHT
WHT/BLU
S 12 11 10 9 8 7 6 5 4 3 2 1
RED
WHT
Q 6 5 4 3 2 1
C 1 2 3 4 5
RED
6 5 4 3
4 DOLBY CIRCUIT BOARD
SLD
WHT
WHT/PNK
PNK
WHT
ORG
SLD
WHT
RED
BLU
BRN
GRY
12 11 10 9 8 7 6 5 4 3 2 1
WHT/PNK
WHT
PNK
WHT
BLU
WHT
YEL
BRN
12 11 10 9 8 7 6 5 4 3 2 1
N
RECORD/PLAYBACK HEAD
WHT
PNK
PNK
WHT
GRY
BLK
Q
WHT 1
PNK 2
SLD 3
SLD 4
PNK 5
WHT 6
GRY
RED
WHT
D32
D29
D30
D31
2 LED CIRCUIT BOARD
BRN
RED
ORG
YEL
L. BLU
1 2 3 4 5 6
I
WHT
WHT/BLU
RED
3 2 1
J

NOTES:
BLK......Black
BLU......Blue
BRN......Brown
GRY......Gray
GRN ...Green
L. BLU ...Light Blue
NIL ......No Color Mark
ORG ...Orange
PNK......Pink
RED......Red
SLD ......Shield Wire
VLT ......Violet
WHT......White
YEL ......Yellow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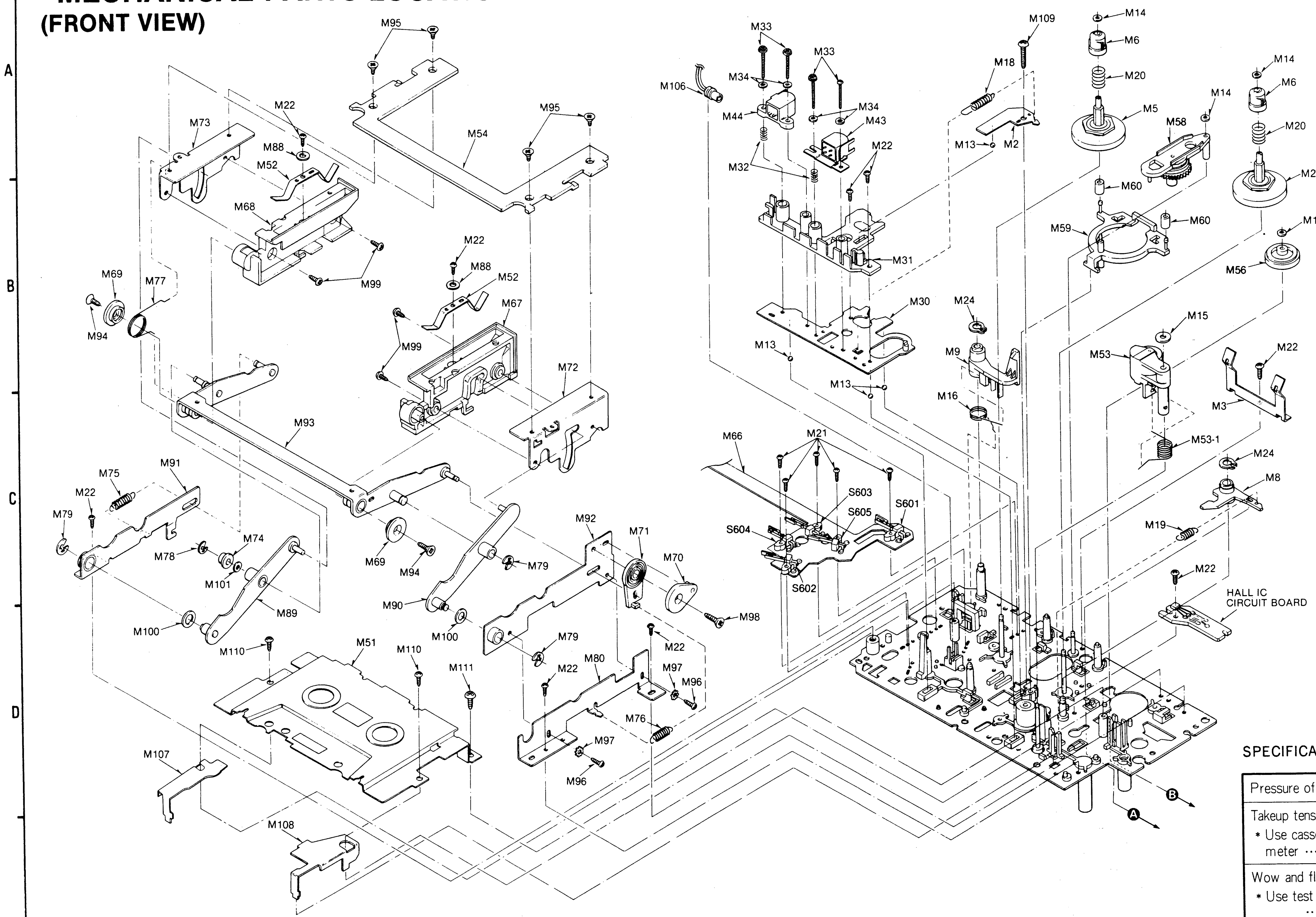
A
B
C
D
E
F
S607 (Metal)
TAPE SELECT SWITCH
S606 (CrO2)
W
K
17 SWITCH (S402) CIRCUIT BOARD
AC POWER TRANSFORMER
V
AC POWER CORD
C420
S401
7 POWER TRANSFORMER CIRCUIT BOARD
H
DOLBY NR
N
I
R
C
ERASE HEAD
Z
6 VOLTAGE REGULATOR CIRCUIT BOARD
LUG TERMINAL
B
G
S602
S605
S601
S604
S603
12 LEAF SWITCH CIRCUIT BOARD
L
S515
11 TIMER CIRCUIT BOARD
Y
X
D
16 MECHANISM CONTROL CIRCUIT BOARD
E
F
T
P2
P1
TRIGGER PLUNGER
BRAKE PLUNGER
S
C805
L802
L803
15 REEL MOTOR CIRCUIT BOARD
CAPSTAN MOTOR
M
IC503
9 HALL IC CIRCUIT BOARD
8 FL METER CIRCUIT BOARD
D518
D517
S508
S502
S503
D516
D511
D519
S506
S505
S507
S501
S504
S509
13 KEY BOARD CIRCUIT BOARD
14 PUSH SWITCH CIRCUIT BOARD
S513
S514
S511
S512
D514
A
PILOT LAMP
P
10 CERAMIC LOCK CIRCUIT BOARD
J

MECHANICAL PARTS LOCATION

(FRONT VIEW)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M95
M33
M34
M44
M32
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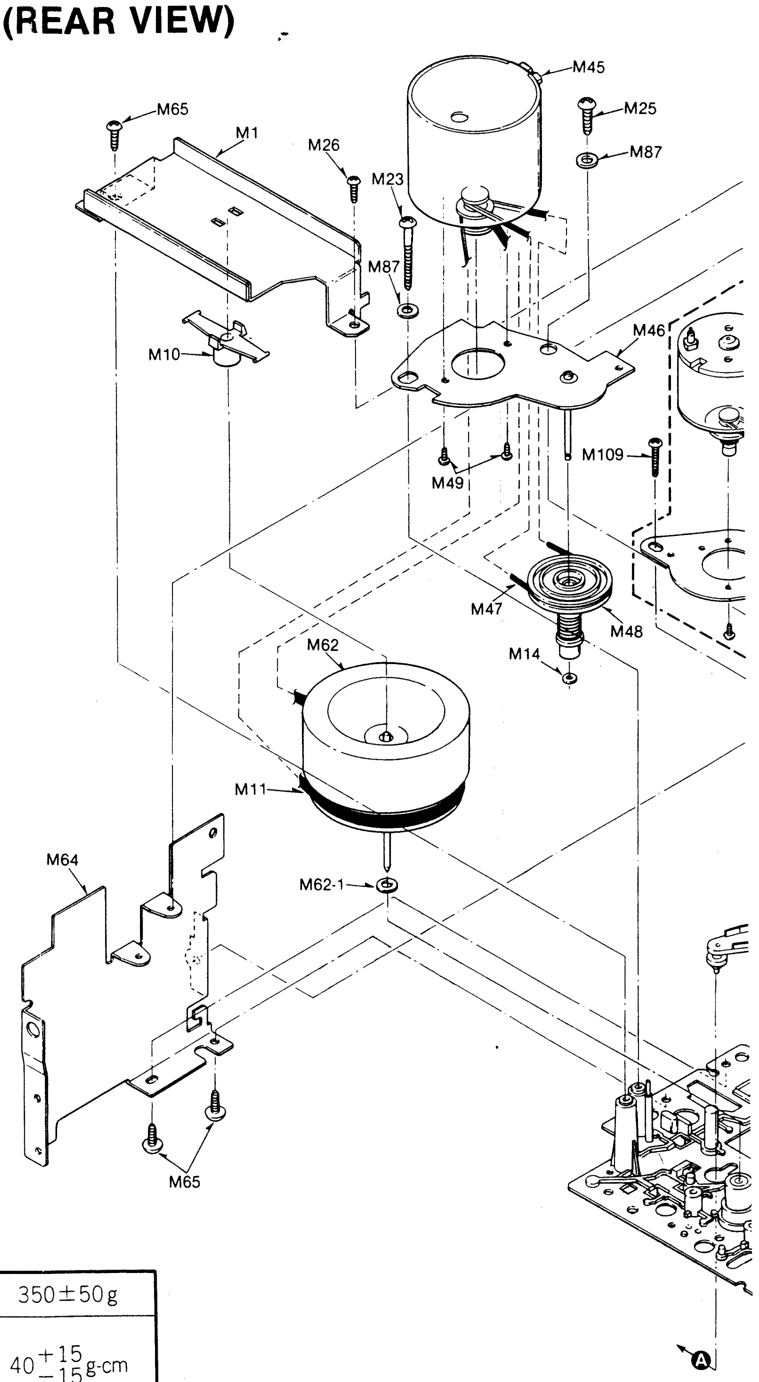
M43
M22
M109
M18
M13
M2
M14
M6
M20
M5
M58
M60
M59
M29
M56
M73
M88
M52
M68
M99
M54
M31
M30
M24
M9
M16
M15
M53
M53-1
M3
M8
M19
M69
M77
M94
M67
M72
M93
M66
M21
S603
S601
S605
S604
S602
M75
M91
M79
M74
M78
M101
M89
M100
M110
M90
M92
M71
M70
M98
M51
M111
M80
M97
M96
M76
M107
M108
HALL IC
CIRCUIT BOARD
Ⓐ
Ⓑ

(REAR VIEW)


8
9
M65
M1
M26
M23
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M25
M87
M10
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M109
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M48
M14
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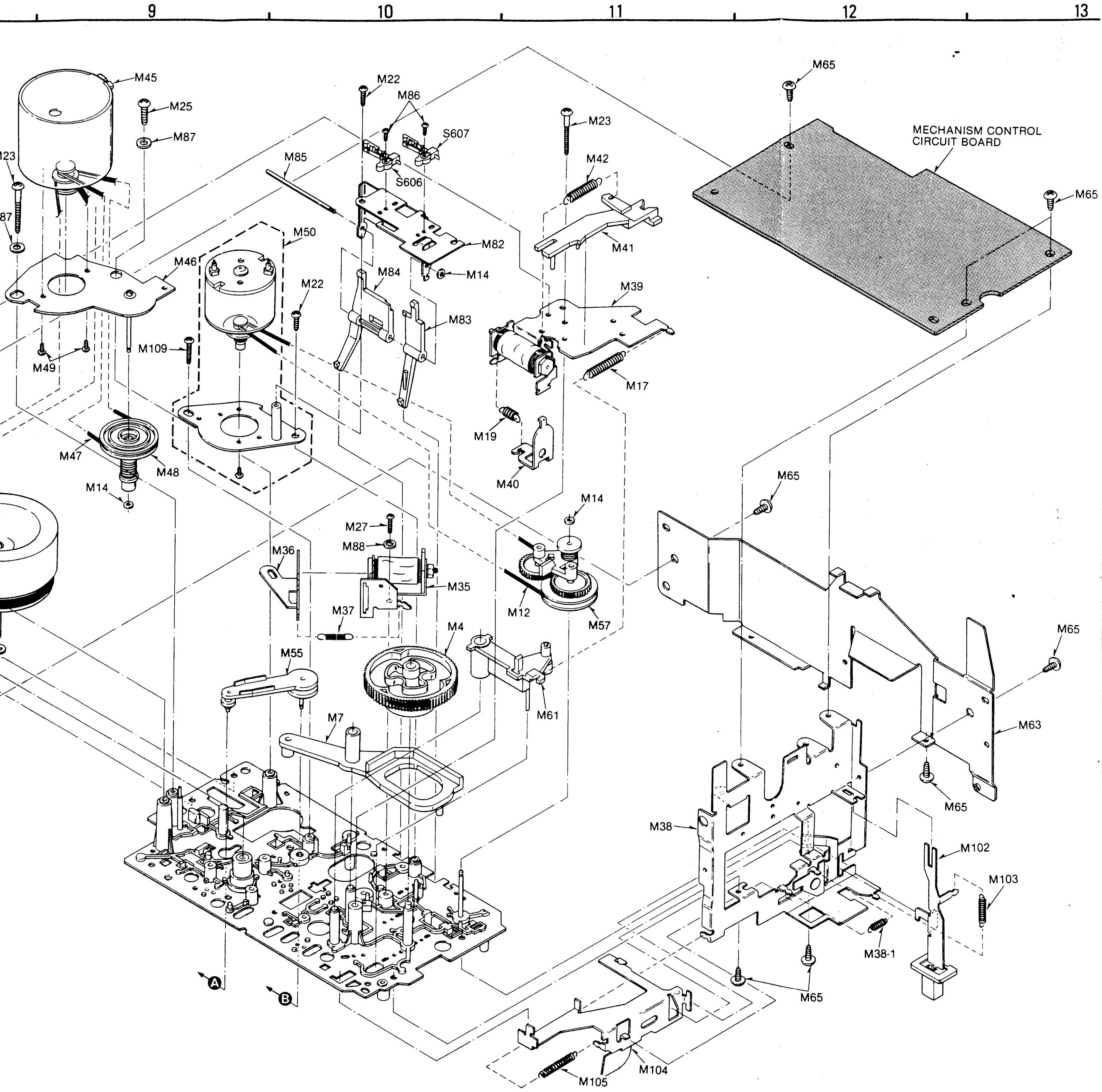
M11
M62-1
M64
M65
Ⓐ

SPECIFICATIONS

Pressure of pressure roller	350±50g
Takeup tension * Use cassette torque meter ……QZZSRKCT	40^{+15}_{-15}g-cm
Wow and flutter; (JIS) * Use test tape ……QZZCWAT	Less than 0.05% (WRMS)

REPLACEMENT PARTS LIST

Ref No.	Part No.	Part Name & Description
		MECHANICAL PARTS
M 1	QMA4450	Flywheel Retainer
M 2	QBP1894	Head Base Plate Spring
M 3	QBP1895	Cassette Pressure Spring
M 4	QXG1059	Main Gear Assembly
M 5	QDR1146	Supply Reel Table
M 6	QMB1336	Reel Table Hub
M 7	QML3655	Cam Follower
M 8	QML3660	Idler Select Lever
M 9	QML3661	Erase Safety Lever
M 10	QMZ1293	Flywheel Thrust Retainer
M 11	QDB0326	Flywheel Belt
M 12	QDB0287	Changing Belt
M 13	QDK1012	Steel Ball 2.5φ
M 14	QBW2008	Snap Washer
M 15	QBW2046	Snap Washer
M 16	QBN1772	Erase Safty Lever Spring
M 17	QBT1725	Lock Lever Spring
M 18	QBT1927	Head Base Plate Spring
M 19	QBT1920	Idler Spring
M 20	QBC1373	Reel Table Spring
M 21	XTN2+5B	Tapping Screw ⊕2×5
M 22	XTN26+6B	Tapping Screw ⊕2.6×6
M 23	XTN3+24B	Tapping Screw ⊕3×24
M 24	XUB4FT	Stop Ring 4φ
M 25	XTN3+10B	Tapping Screw ⊕3×10
M 26	XTN3+10B	Tapping Screw ⊕3×10
M 27	XTN26+8B	Tapping Screw ⊕2.6×8
M 29	QXD0120	Takeup Reel Table Assembly
M 30	QMK1867	Head Base Plate
M 31	QMZ1263	Head Spacer
M 32	QBC1103	Head Spring
M 33	XSN2+16	Screw ⊕2×16
M 34	XWG2	Washer 2φ
M 35	QXA1232	Brake Plunger Assembly
M 36	QML3865	Plunger Lever
M 37	QBT1955	Plunger Spring
M 38	QXA1216	Side Angle Assembly
M 38-1	QBT1920	Idler Spring
M 39	QXA1076	Trigger Plunger Assembly
M 40	QML3651	Trigger Plunger Lever
M 41	QML3653	Control Lever
M 42	QBT1278	Record Lock Lever Spring
M 43	Refer to E1	Record/Playback Head
M 44	Refer to E2	Erase Head
M 45	QXU0299	Capstan Motor Assembly
M 46	QXA1077	Motor Retainer Assembly
M 47	QDB0286	Takeup Belt
M 48	QXP0621	Takeup Pulley Assembly
M 49	XSN26+3	Screw ⊕2.6×3
M 50	QXU0250	Reel Moto Assembly
M 51	QXH0410	Mechanism Cover Assembly
M 52	QBP1925	Cassette Pressuer Spring
M 53	QXL1550	Pressure Roller Assembly
M 53-1	QBN1771	Pressure Roller Spring
M 54	QMF2234	Cassette Holder Plate
M 55	QXL1423	Idler Lever Assembly
M 56	QXi0116	Takeup Idler Assembly
M 57	QXL1408	Swing Gear Assembly
M 58	QXL1409	Fast Wind Gear Assembly
M 59	QML3659	Brake Lever
M 60	QBG1132	Brake Rubber
M 61	QXL1411	Lock Lever Assembly
M 62	QXF0200	Flywheel Assembly
M 62-1	QBW2099	Poly Washer
M 63	QMA4085	Center Angle
M 64	QMA4449	Side Angle-R
M 65	XTN3+6B	Tapping Screw ⊕3×6
M 66	QJi1466RR	Leaf Switch P.C.B
M 67	QMH2069	Cassette Holder-R
M 68	QMH2070	Cassette Holder-L
M 69	QKJ0465	Damper Cover
M 70	QDP1892	Damper Pulley-1
M 71	QDP1893	Damper Pulley-2
M 72	QMA4114	Holder Angle-R
M 73	QMA4115	Holder Angle-L
M 74	QDP1894	Rol
M 75	QBT1932	Lin
M 76	QBT1931	Lin
M 77	QBN1827	Hol
M 78	XUC2FT	Sto
M 79	XUC3FT	Sto
M 80	QMA4112	Ang
M 82	QMA4072	Aut
M 83	QML3716	Tap (for
M 84	QML3717	Tap (for
M 85	QMN2642	Det
M 86	XTN2+6B	Tap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S607
S606
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MECHANISM CONTROL
CIRCUIT BOARD
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M102
M103
M38-1
M65
M104
M105
A
B

& Description	Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Description
Assembly	M 74	QDP1894	Roller	M 87	XWG3	Washer 3ϕ	M 101	QBW2014	Poly Washer
sembly	M 75	QBT1932	Link Lever-L Spring	M 88	XWG26B	Washer 2.6ϕ	M 102	QXL1536	Eject Button Assembly
r	M 76	QBT1931	Link Lever-R Spring	M 89	QXL1450	Link Lever-L Assembly	M 103	QBT1932	Eject Lever Spring
e	M 77	QBN1827	Holder Spring-L				M 104	QML3772	Lock Lever
R	M 78	XUC2FT	Stop Ring 2ϕ	M 90	QXL1451	Link Lever-R Assembly	M 105	QBT1933	Lock Lever Spring
ew ⊕3×6				M 91	QXA1137	Angle-L Assembly	M 106	XAMQ44P200	Pilot Lamp
P.C.B	M 79	XUC3FT	Stop Ring 3ϕ	M 92	QXH0361	Angle-R Assembly	M 107	QMA4448	Reinforcement
older-R	M 80	QMA4112	Angle-R	M 93	QXL1452	Center Lever Assembly			Angle-A
older-L	M 82	QMA4072	Auto Tape Selector Angle	M 94	XTS26 + 8B	Screw ⊕2.6×8	M 108	QMA4447	Reinforcement
	M 83	QML3716	Tape Detection Lever	M 95	XSS26 + 4BV	Screw ⊕2.6×4			Angle-B
er			(for CrO_2 Tape)	M 96	XSN3 + 6S	Screw ⊕3×6	M 109	XTN26 + 12B	Tapping Screw ⊕2.6×12
ey-1	M 84	QML3717	Tape Detection Lever	M 97	XWC3B	Washer 3ϕ			
ey-2			(for Metal Tape)	M 98	XSS26 + 8	Screw ⊕2.6×8	M 110	XTN26 + 6BFZ	Tapping Screw ⊕2.6×6
e-R	M 85	QMN2642	Detection Lever Shaft	M 99	XSN26 + 4BV	Screw ⊕2.6×4	M 111	XTN3 + 8B	Tapping Screw ⊕3×8
e-L	M 86	XTN2 + 6B	Tapping Screw ⊕2×6	M 100	QBW2020	Poly Washer			